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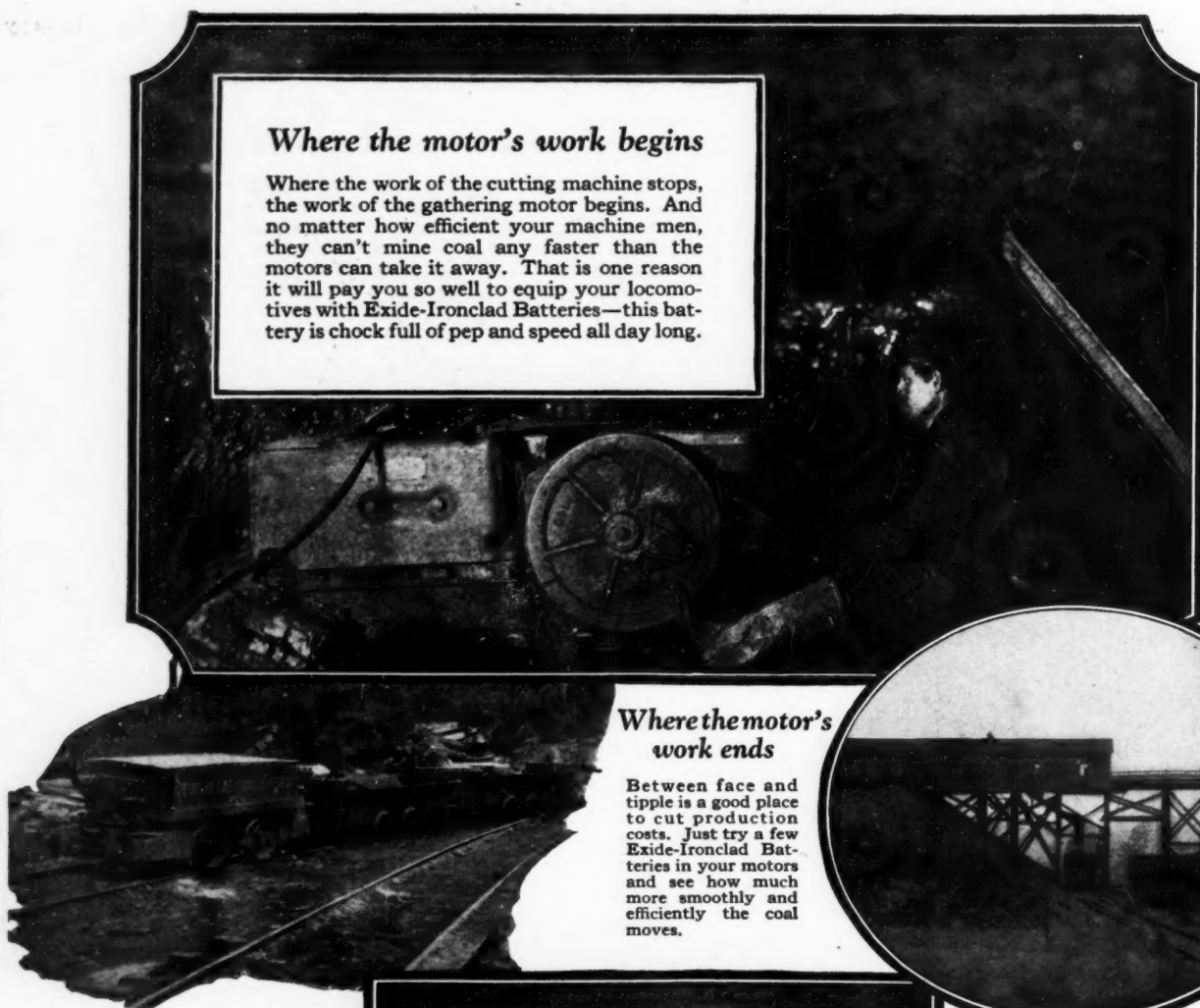
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With which is consolidated "The Colliery Engineer" and "Mines and Minerals"
R. DAWSON HALL, Engineering Editor

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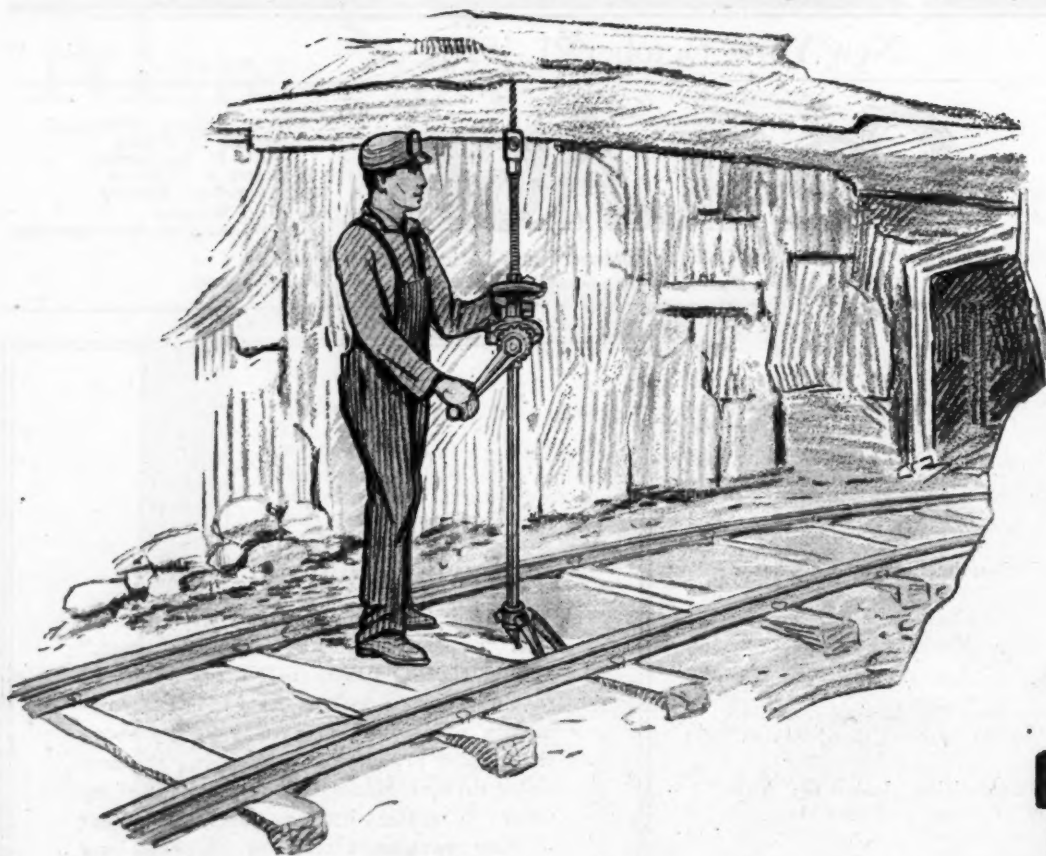
Saving Money at Valier

Many years ago, somebody stated truly that "a penny saved is a penny earned." Today, there appears to be two ways of making a profit on coal, or any other commodity, namely, either getting a price above the cost of production or lowering the cost of production below the obtainable selling price. It matters little, in what department of mine operation savings are made, so long as they are effected and show on the balance sheet.

Probably few coal operations in the country have made more improvements to a mine equipment and layout, that already was justly considered modern and efficient, than Valier. In next week's *Coal Age*, A. F. Brosky will describe some of the more recent betterments that have been made at this operation, particularly in the haulage system. Valier is a railroad-owned mine and has borrowed much from railroad experience and practice in the matter of signaling and dispatching. Even the bottom foreman has been put to productive work since the signaling system has been installed.

Nemacolin's New Methods

W. Z. Price, also, in the next issue of *Coal Age*, will describe the methods of the Buckeye Coal Co., at its mammoth Nemacolin mine, where safety, permanence and efficiency combine to make economical operation possible. The system of haulage has been carefully planned as it should be in every large operation. Ventilation, coal cutting, timbering, safety methods and tipple will be described by A. W. Hesse later, the publication being delayed for the preparation of line drawings.



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Devoted to the Operating, Technical and Business
Problems of the Coal-Mining Industry

R. DAWSON HALL
Engineering Editor

Volume 30

NEW YORK, OCTOBER 21, 1926

Number 17

Run-of-Oven

FURNACE MEN are getting to demand closely sized coke. After all is said, the shatter and rumble tests were devised not so much to protect the furnace man against weak coke as to assure him that he will not get a large quantity of small and assorted sizes that will fill up the voids in the furnace and deflect the fire from the combustible. Though it may be granted that coke should not break and thus become a dense mass, it may be safely asserted that the fuel content of the furnace will pass and distribute air with greater certainty if the coke is sized before charging. A mixture of large- and small-sized fuel is rendered less likely if the coke as delivered is of equal size. If sized before being discharged into the furnace it is less likely to choke than if in the form of run-of-oven. It is important that this size be maintained, and the shatter and rumble tests determine whether this will occur.

The present need is for a determination of the best or the minimum size and the proper range in sizes. The coke man must be consulted. There should not be too many sizes, nor should the coke man be asked to break the coke unnecessarily, as this would result in the formation of an excessive proportion of breeze, for which the furnace man will ultimately have to pay. There probably is a preferable size or series of sizes, having this consideration in mind, and study is needed for their determination. Furnace operation today is empiric, but it need not be so little understood and regulated as it is at present. In earlier days the only demand was that the coke should be large. But with coke as with coal, it has been found that a small product of uniform dimensions is probably at least as desirable as a large ungraded product if not more so.

In the past buyers of coal and coke alike have been too anxious for large sizes. Gradually both are beginning to see the problems of combustion in a clearer light.

Does Gas Come from Coal?

VIEWING THE SUBJECT from the standpoint of the gas-and-oil belt, Frank Haas, at the American Institute of Mining and Metallurgical Engineers' meeting, in Pittsburgh, declared that it was his thought (not to say opinion) that most of the hydrocarbon gases encountered in mines are natural gas and that coal beds are simply the reservoir and path of flow from other strata.

But has he considered the anthracite region, which also has mines which are extremely gassy? In that field, gas has been discovered nowhere but in the coal measures, and oil has not been found at all. Under distillation the shales of that region fail to give either oil or gas. Whence, then, does the methane in the anthracite mines come? Surely in such workings the coal bed must be the source of gas and not merely the channel.

"A close study of the ultimate analyses of coals will

show," according to Mr. Haas, "that the transition from high- to low-volatile coal can take place by successive removals of combined water with no loss of carbon whatever." That statement may safely be left to the geologists to controvert. With the ash and nitrogen content about the only quantities fixed with regard to time and temperature and with both percentages so variable in different peats it is difficult to see how Mr. Haas' statement can be confirmed or contradicted by geologists, except by unproved dicta. No one can tell whether carbon has been lost. Its percentage increases, but that is undoubtedly due to larger losses in other elements in the fuel.

The more one considers Mr. Haas' suggestion, the more one is disposed to question whether his position is tenable even in the high-, medium- and low-volatile fields. The Bureau of Mines doubts seriously if ethane is ever found in coal except near gas wells. Assuming that is correct, then why, if the hydrocarbon gas in coal comes from natural gas, does it contain no ethane? G. S. Rice, at that meeting, thought the ethane might be changed catalytically to methane. That is an ingenious suggestion, but so questionable is it, as Mr. Rice doubtless will admit, that it scarcely justifies one in basing any theory on it.

Adequate Appropriations

SOME YEARS BACK, the U. S. Bureau of Mines initiated the practice of testing equipment for safety and began earmarking certain machinery as "permissible"—an excellent practice and well conducted. But it has one drawback. Unless the Bureau receives from the U. S. Government, appropriations to test devices as fast as presented, manufacturers will be disposed to delay the development of such equipment.

If no machinery for government approval were provided, flameproof devices might be put on the market with the manufacturer's guarantee or the manufacturers might themselves establish an impartial testing station that would issue certificates of permissibility. But with the government approval being given, in however dilatory a fashion, the manufacturer hesitates to construct a flameproof device on a quantity basis till he is assured that the patterns will not have to be destroyed and the methods of manufacture changed to suit some demand of the official examiners. So the introduction of flameproof devices is delayed until the Bureau of Mines is ready to make investigation of their merit, and their sale is delayed until the approval is granted.

The U. S. Bureau of Mines should, therefore, have the needed facilities of equipment and staff to make prompt test and to grant speedy approval of new flameproof equipment. Otherwise, it may be found that the institution of the practice of approving such equipment actually restricts its natural development.

The Cost of Absenteeism and "Quits"

WHY DO MEN lay off? Why do they quit? Pure cussedness? Well, they are human. If it were known why they lay off or why they seek change without advantage, would something be done to lower the losses resulting therefrom? A miner has a working place; it represents a certain capital investment in land and equipment available for the use of that man wherewith to make an income. There is also a certain cash outlay required to maintain service for him, such as haulage and tippie men. The man loses the wages for the day on which he lays off and when he quits there is the loss of earnings between jobs and often the moving expense.

The company loses because it has parted with a trained and experienced man; sometimes real money has been spent to train him; it has lost a certain possible production which is income. When other industries started to study the problems of absenteeism and "quits" the financial loss revealed was staggering—it was enormous. Something had to be done. Personnel departments were organized as a result, because opportunities were presented for real service. These departments soon ceased to be looked upon as unnecessary "overhead." They became producers.

For years, the coal industry has studied coal geology, machinery, methods of mining and what not. Some companies are now beginning to study men. Their researches will pay because man is always worth studying.

Time to Think

NO MANAGER, superintendent or engineer can be efficient who cannot find time to study the various types of equipment and to arrive at a conclusion as to which type he should be using. Too many have no time to think. A better way of doing the job he has on hand should not pass unconsidered, because, perhaps, bolts have to be delivered on a certain job or a certain piece of work has to be laid out. Too many mines have fallen into a rut because the officials were judged by the work performed rather than by the manner and economy of its accomplishment.

The man who has no time for study, investigation and inquiry, who cannot find time to read his technical paper, will perform his work inefficiently. Rushed off his feet, he must depend on past practices—"past" not only in the sense of "accomplished" but "past" in the sense of being rejected by all skillful and well-posted men as being no longer the best way of performing the task involved.

Sturdy Last Legs

BBRITISH MINE WORKERS still loyal to the leaders of their union show a disregard verging on the contumacious for the verdict of the optimists on both sides of the Atlantic who have been busy forecasting the early end of the British strike. Several weeks have passed since it was first predicted that the strike was "on its last legs," but those metaphorical limbs continue to support, albeit somewhat shakily, the main body of the followers of "Emperor" Cook. If the temper of the rank and file may be judged at this long range, several weeks will have elapsed before coal production in Britain is within hailing distance of normal.

Unquestionably the position of the British Miners' Federation has been measurably weakened. Ill-advised leadership, ready acceptance of Soviet aid, internal dissensions, increasing desertions by men who find rhetoric a poor substitute for food, and attacks from without have sapped the organization's strength. Small groups who braved the opprobrium of the epithet of "blackleg" have been followed in some areas by whole districts. It is significant, however, that no headway has been made in resuming operations in South Wales, the field which dominates the export situation. Open disaffection is slight also in certain other important districts.

Barring some turn not now anticipated, therefore, it is more reasonable to assume that the breaking of the strike will come through the slower processes of disintegration now going on than through any sudden collapse that would send the majority of the men scurrying back to work over night. But regardless of how soon the suspension may terminate, the British mining industry must still face the problem of an economic readjustment too long postponed by political intervention. Royal commissions have investigated and reported; prime ministers have counseled, threatened and cajoled—without bringing the problem any nearer solution. Postponement has served only to multiply confusion and increase bitterness.

It is this bitterness which makes the present situation so hopeless. Victory, if victory it may be called, appears to rest with the mine owners in their fight to smash the national agreement system and to force a return to the eight-hour day. Men are taking up their tools, and their buddies sooner or later will do likewise, moved not by conviction, but driven by necessity. Old hates, old prejudices will burn the brighter in defeat. Until the British genius for compromise reasserts itself and brings about a real partnership in objectives between mine owner and mine worker, the labor situation will remain a menace to the rehabilitation and prosperity of the coal industry of the United Kingdom.

False Values

SELLING COAL at less than cost involves damage to the individual producer and to the industry as a whole far beyond the immediate losses incurred. The latter may be recouped. The false ideas of value which a red-ink production policy create in the public mind, however, cannot be offset with the same facility. On the contrary, these very recoupments intensify, rather than repair, the larger injury done the industry by a policy of placing tonnage records ahead of profit records.

In the case of nearly every business there are some transactions which do not pay their way. There are individual units which suffer long seasons of depression. But inevitably the public comes to doubt the validity of the protestations of an industry in which loss over an extended period to the majority of the units in that industry is accepted as a natural concomitant of that business. Wonder passes into disbelief, and subnormal prices impress themselves upon the public mind as normal values.

Much has been said in times past of the waste of capital assets involved in the mining of coal for sale at a loss. Too little attention has been directed toward the fact that such waste also makes it increasingly difficult, if not at times impossible, to realize a fair return on the coal still unmined. Viewed in its proper perspective, this secondary waste is the more deadly.

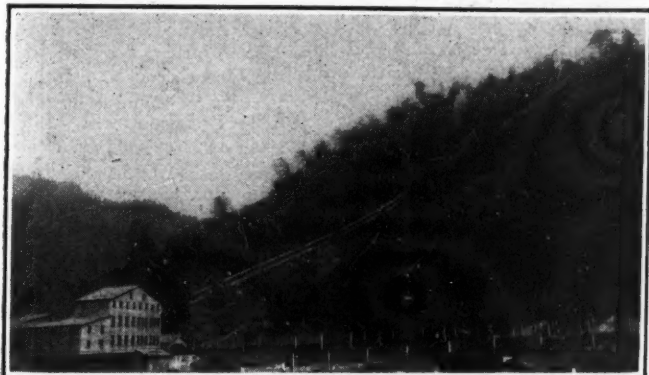
In Two Years Amherst Improvements Return Cost

Rope-and-Button Conveyor Replaces Monitors—Five Men, One Locomotive and 60 Mine Cars Will Be Released to More Productive Duty — Inspection Table Will Be Installed in New Headhouse

By J. H. Edwards

Associate Editor, *Coal Age*, Huntington, W. Va.

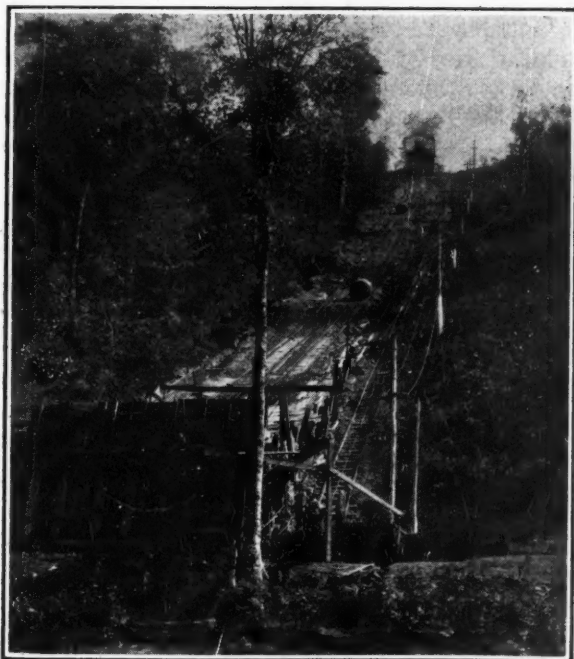
TO POINT OUT faults in methods and equipment at the average mine is not difficult, but to plan improvements the earning power of which will interest the banker is another story. An analysis of almost any case among the many improvement activ-



New Rope-and-Button Conveyor

The distance between head and tail sheaves is 1,088 ft., and the difference in elevation approximately 450 ft. The combined tipple and washery was built several years ago. The bed of coal occurring at tipple height is the Eagle, and that at the top of the hill the Chilton.

ities now under way in the Southern bituminous fields will disclose the fact that the particular improvement in hand has been carefully planned and that it will contribute in several ways to the welfare of the mine.

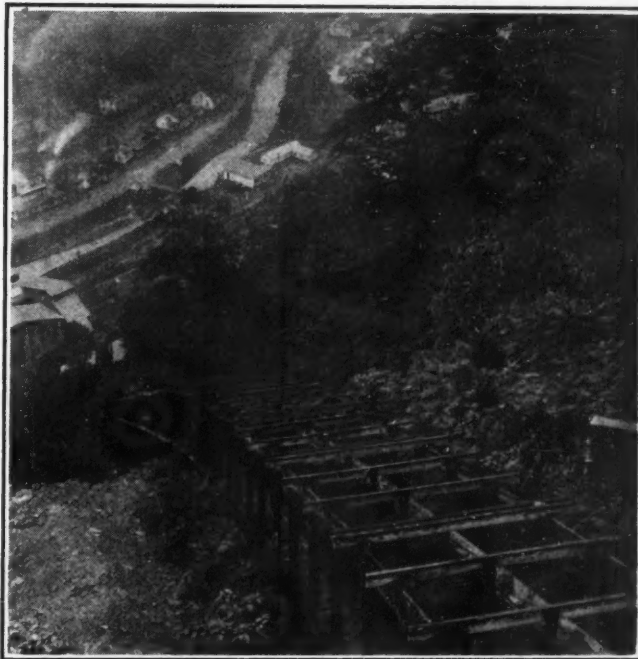


Monitor Plane That Will Be Displaced

The foot of this plane is 1,000 ft. from the tipple. To haul the coal this distance now requires the services of three men and equipment consisting of a 10-ton locomotive and 60 mine cars. Handling by monitor as well as rehandling in the mine cars causes excessive breakage.

Aiming to kill six birds with one stone, the Amherst Coal Co., of Logan County, W. Va., is now completing at the Amherst No. 2 mine, at Braeholm, the installation of a headhouse and rope-and-button conveyor that will slice several cents per ton from the present cost of production while simultaneously bettering the quality of the output. This improvement will displace a monitor plane by which the coal is now lowered down a mountain side from the Chilton bed to a tramroad leading to the tipple.

The mine is already equipped with an elaborate tipple and washery which handles the output of the Eagle and Chilton measures. The Eagle bed occurs at tipple



Looking Down from the Headhouse

Excepting for about 50 ft. next to the tipple the conveyor structure is of wood. The rope speed will be 100 ft. per minute and the conveyor will have a capacity of 300 tons per hour. On the opposite side of Buffalo Creek is the generating plant of the Buffalo Eagle Colliery Co.

height, but the Chilton lies 450 ft. above. As now handled, coal from the latter seam is dumped in a monitor headhouse that requires five men for its operation. It is dumped again from the monitors into a bin at the foot of the incline, and is here loaded through a chute into mine cars and hauled 1,000 ft. to the tipple. Three men, a 10-ton locomotive and 60 mine cars are engaged in loading and hauling coal at the bottom of the plane.

Altogether eight men are employed in transporting the coal from the mine portal to the tipple, and the coal is handled no less than five times including the final dumping at the preparation plant. With the new arrangement only three men will be employed and the coal will be dumped but once. One of the three men



Construction View of Conveyor Headhouse

Between the dump and the feeder will be an inspection table. The rope-and-button retarding conveyor will be driven by a 40-hp. induction motor of the wound-rotor type. It is expected that this will be loaded to 30 hp. at starting, but will regenerate 10 hp. under normal working conditions.

will spend most of his time at an inspection table, which forms an important item of the equipment in the new headhouse.

The changes will also include provision for simplifying and cheapening the handling of slate. Cars loaded with this material will be brought out of the mine in the regular trips, but when one of these cars arrives at the dump the operative will throw a fly diverting the slate at right angles into a chute leading down a steep hill, to the refuse pile.

Counting the above improvement to slate disposal, six distinct advantages will be gained by the new construction. The other five are, (1) reduction of coal breakage, (2) saving the wages of five men, (3) releasing a 10-ton locomotive and 60 mine cars for other duty, (4) providing a means of inspecting the coal dumped from each car, and (5) increasing the productive capacity of the mine.

As will be noted from the accompanying illustrations, the headhouse for the rope-and-button conveyor is being built at a point overlooking the tippie. Here loaded and empty tracks from both ways converge.



Approach to the New Headhouse

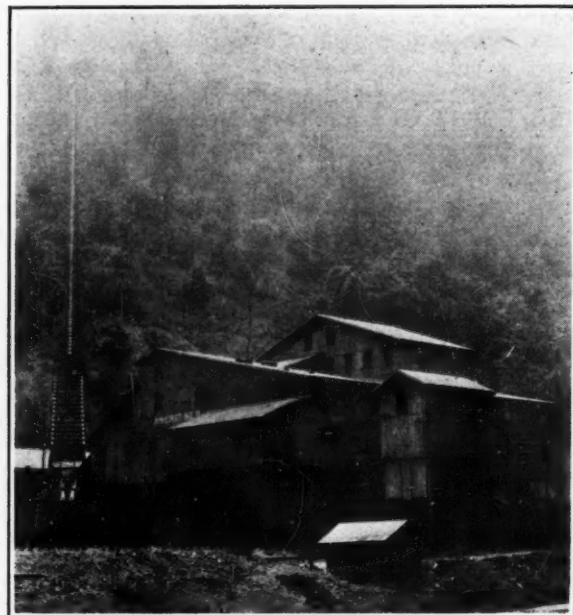
When construction is finished there will be a haulway around the hill from both directions. The track at the left leads to a new opening which will serve as a second haulway. This mine has been opened in a $9\frac{1}{2}$ -ft. bed of coal.

Around the hill to the left is a new opening that will serve as a second haulway. The coal in this bed runs $9\frac{1}{2}$ ft. in thickness at this point.

The rope-and-button conveyor, which is 1,088 ft. long between centers of head and tail sheaves, is designed for a rope speed of 100 ft. per minute and a capacity of 300 tons per hour. The rope, in which the calculated maximum stress will be 16,000 lb., is $1\frac{1}{8}$ -in. and has a rated ultimate strength of 88,000 lb. A 40-hp. 440-volt

induction motor of the wound-rotor type will be used to start the conveyor and act as a regenerative brake. This drive will be equipped with a solenoid brake that will act only when power is cut off from the motor. Approximately 10 hp. will be generated by the conveyor under normal working conditions.

Provision for proper signaling and control has been



Tippie and Washery of the Amherst Coal Co.

The partially completed frame of the new rope-and-button conveyor is somewhat obscured by a downpour of rain that started just as the photograph was made. The tippie and washery, which was built several years ago, is the most elaborate in Logan County.

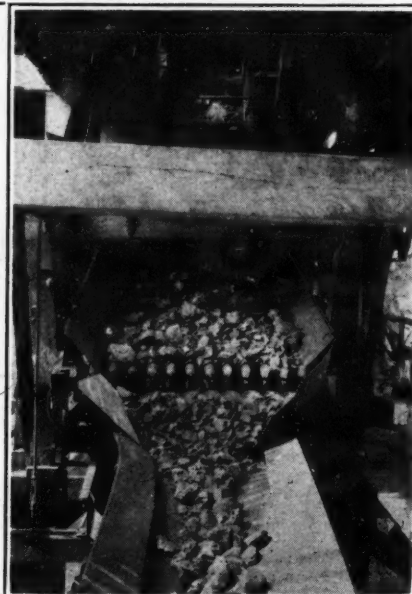
given special attention. The motor is equipped with an automatic starter which will be controlled from several independent push-button stations. A buzzer signal system and telephone equipment will also be installed, insuring proper co-ordination between top and bottom.

It is expected that these improvements, including new tracks, headhouse and conveyor, at Amherst No. 2 mine will pay for themselves within two years. The equipment was furnished by the Pittsburgh Coal Washer Co., and the general engineering work, such as preliminary layout and location, is under the direction of A. S. J. Hopkins, assistant manager and chief engineer of the coal company.

Separating Coal on a Grizzly with Smooth Rollers

This separator is preparing the friable coal of the Jaffy Coal Mining Co., Shaw, W. Va. The grizzly has rollers of 4-in. diameter and 10 ft. long. The width of the screen is 6 ft. The rolls all turn in the same direction at a speed of approximately 300 r.p.m. They are sloped at an inclination of about $3\frac{1}{2}$ in. to the foot. The screens are producing egg coal $1\frac{1}{4} \times 4$ in. and nut coal $2 \times 1\frac{1}{2}$ in.

Courtesy, the
Frederick Iron &
Steel Co.



Pittsburgh Coal Mining Institute Considers Mine Ventilation and Favors Trained Fire Corps

Air Needed for Mine Ventilation Weighs Three Times as Much as Coal Produced—Electrical Devices Should Have Extinguishers — Underground Fire Corps Advocated

ABOUT FORTY MEN attended the first fall meeting of the Pittsburgh Coal Mining Institute, held on the evening of Oct. 1 in the Chamber of Commerce auditorium, Pittsburgh, Pa. The session was devoted to ventilation in its various phases; also to the reading, consideration and indorsement of a committee's recommendations on what constitutes proper equipment for fighting mine fires. The only paper of the evening, on "Mine Fans and Ventilation," was presented by Louis W. Huber, instructor in mining at the Carnegie Institute of Technology.

Roughly, about 3.15 tons of air are pumped into a mine of 3,000 tons daily capacity for every ton of coal produced, said Mr. Huber, and the duty thus imposed requires approximately 23 per cent of the power consumed at the mine. A decrease of 5 hp. in the fan motor requirement will pay annual interest at 6 per cent on \$5,000 and at the same time provide a sinking fund that will wipe out the investment in 10 years. This proposition should prove attractive to the managements of old mines now equipped with obsolete fans. The savings hinge on the fact that the old types of fans are far less efficient than the newer and more modern designs.

Mr. Huber deplored the fact that airways in most instances are shamefully neglected. Coal companies are willing to spend plenty of money in keeping haulways clean and free from obstructions but frequently refuse to extend this practice to the maintenance of back entries. The speaker went on record as believing that that portion of mine resistance due to turbulence in reality is of great magnitude and is frequently lost sight of by mining men. Much of this turbulence, of course, can be eliminated by making all changes in the direction of travel of high-velocity air currents gradual instead of abrupt. Curves in entries and the approaches to overcasts should be smoothed out, and airways cleared of obstructions, if the effects of turbulence are to be avoided.

He spoke highly of the merit of the multiple entry system, consisting of as many as eight intakes and an equal number of returns, as a means of improving ventilation. It is his understanding that a certain West Virginia operation with a layout of many entries maintains a ventilating current of 100,000 cu.ft. per minute with a pressure as low as 0.2 in. of water gage. Frank Haas, consulting engineer of the Consolidation Coal Co., was credited with being the pioneer in this important development in ventilation practice.

One reason mine ventilation is poor is that it is thought of as being exceedingly complicated in prin-

ciple, whereas in reality it is extremely simple. The flow of air in ventilation is analogous to the flow of water and its principles should be as simply stated. Mechanical efficiency only should be considered by mining men, to the exclusion of manometric and volumetric efficiencies, which do not mean anything from the standpoint of dollars and cents. Fans should be tested more often than they are at present.

If the interpretation of the mining law is that 200 cu.ft. of air per minute must be conducted to every last breakthrough, for every man and animal employed in the respective mine sections, then many mines today are breaking the law, remarked John I. Pratt, state mine inspector and president of the institute, in discussing this paper. A lively

interest was taken in Mr. Huber's comparison of efficiencies yielded by fans with forward and backward curved blades. Richard Maize, state mine inspector, condemned as "criminal" the use of blowers in a system of auxiliary ventilation in gaseous mines. His remark was inspired by an allusion in Mr. Huber's paper to the need of permissible electrical equipment for this purpose.

A MINE must necessarily be ventilated day and night. In some instances the speed of the fan may be cut down at night or on idle days, but in almost every case a continuous expenditure of power is necessary to keep the underground operations clear of dangerous gas. It is because of the fact that it is operative all of the time that any decrease that may be effected in the air pressure against which the fan works pays such large returns in dollars and cents.

Mr. Pratt stated that about 99 per cent of present-day explosions are attributable directly to poor ventilation. With the coming of the winter months, urged Francis Feehan of the U. S. Bureau of Mines, every precaution should be taken to lessen the likelihood of explosions. A recent bulletin from the pen of W. W. Adams, U. S. Bureau of Mines statistician, states that in the first nine months of this year, nine major explosions occurred in this country. This is the greatest number to take place during a like period in many years.

H. C. Howarth of the U. S. Bureau of Mines read the report of a committee consisting of himself, Richard Maize and A. R. Pollock, general manager of the Ford Collieries Co., enumerating the various pieces of equipment that should be kept on hand and the organization that should be perfected for combatting mine fires. This report follows:

"In its recommendations governing the installation of fire-fighting equipment in coal mines the committee suggests that the abatement of fire hazard should be first considered. In order that this hazard may be reduced to a minimum, all underground equipment should be designed, installed and maintained with this object in view. The fire-fighting equipment required will depend somewhat on the size of the plant and local conditions. To obtain the greatest protection from the equipment installed it is important that the workmen

be instructed in its use and to this end fire drills should be occasionally held. In a general way the following equipment is best suited for fighting fires in their earlier stages.

"(1) Each piece of electrical equipment, both portable and fixed, should be provided with a quart-size carbon tetrachloride extinguisher, which is the most efficient and satisfactory means of extinguishing fires caused by electricity. All persons likely to use such extinguishers should be warned to keep on the fresh-air side of the fire and cautioned not to be trapped in a pocket by its gases. A suitable gas mask will give some protection from the fumes.

"(2) A pair of 5-gal. acid-and-soda extinguishers should be kept at the mouth of each pair of butt entries or other key locations. They should always be maintained in good working order.

"(3) Dry sand, as used on mine locomotives, and rock dust may be used to advantage in some cases.

"(4) Barrels of water with two fire buckets in each should be kept at trap doors and other points where fires are liable to start. The buckets should be submerged in the water, right side up and ready for use.

"(5) All water pipe lines should be installed in such a manner as to be available for service in fighting fires. Where air lines are installed, it is recommended that they be so arranged that they can be connected to the water lines for the same purpose.

"(6) For protection against fires of larger proportions large chemical tanks mounted on trucks should be provided and kept at the shaft bottom or some other central location in the mine.

"(7) For combating fires that have advanced to the stage where direct attack is no longer feasible, materials should be available for sealing off the fire area. The materials required are brattice cloth, brattice boards, brick, sand, lime and cement; also nails and tools, including saws, hammers, hatchets, picks and shovels. These materials and tools should be kept under lock and key at suitable locations in the mine.

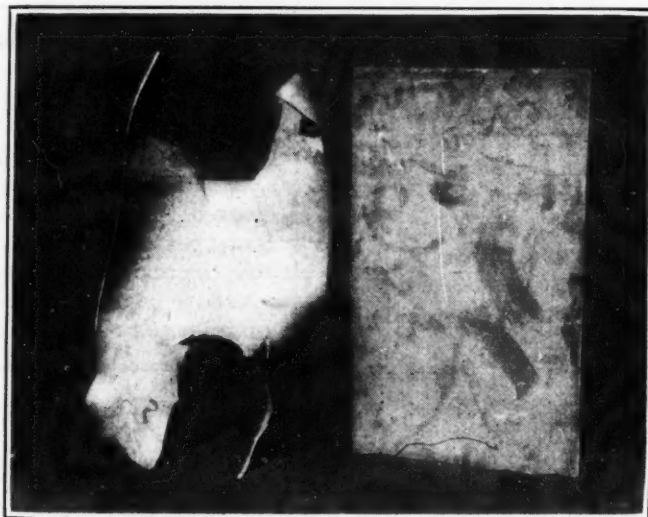
"(8) To secure full value from any fire fighting equipment, it is essential that men be organized into fire crews. Therefore, it is recommended that the officials and all other men whose duties take them from place to place in the mine be organized into fire fighting units. They should be given detailed instructions in the handling of the apparatus and taught to protect themselves and others from fire and smoke."

This report was endorsed by the institute. The provisions suggesting the organizing and training of fire crews were hailed by everyone as a highly meritable innovation from past considerations of a serious problem. Several men stated that steps are now being taken to equip the mines with adequate fire fighting apparatus, but none could recall instances of where men are being trained in the proper use of this equipment.

Does Dynamite Work Downward? Why?

It is an old idea that dynamite works downward. Some credence is given to this notion by the practice of what is known as mud-capping. It has been generally understood that because the force of the explosive under the mud cap breaks the rock that the dynamite worked downward and the rock was broken on this principle only. That this is a wrong conception has been proven by the illustrations shown herewith by courtesy of the Hercules Powder Co.

A series of tests conducted by this company proves that although an explosive acts downward, this is merely a relative term, inasmuch as gases evolved act equally in all directions, but follow the line of least resistance.



Works "Up" as Well as "Down"

In this test a stick of dynamite was placed on top of the plate and one was attached to the underside. Upon detonation both sticks tore holes in the plate, proving that the upward and downward forces are approximately equal.



Comparative Result of "Slow" versus "Fast" Powder

Near one end of the metal plate, in the illustration on the left, was placed a stick of 60-per cent N. G. dynamite and near the other end two sticks of Red HC, L. F. The comparative result is illustrated on the right. The "fast" dynamite sheared off the end of the metal plate. The "slow" powder which was placed at the other end bent it in the middle, without breaking it.

Car Inspections Only Rough Indications Of Impurities in Anthracite

Tests at Separator and on Car Reveal Fact That
Latter Sampling Is Defective — Oversize and
Undersize Differences May Be Due to Breakage

By Frank J. G. Duck

Assistant Editor, *Coal Age*, New York City

INTO EVERY PROCESS and operation that is dependent, either wholly or in part, on the skill of the individual, the "personal equation" or element of human fallibility inevitably enters. Despite their training, experience and best intentions, men are influenced, often to an unsuspected degree, by the appearance of the product and by a tendency, unconscious perhaps, to perform their duties with the least inconvenience to themselves.

This is particularly true in the commercial sampling or inspection of coal, ore, etc., where large quantities are examined daily with a view to a final "check" before the material is shipped to market.

Though on-car inspection of anthracite is intended primarily as a check on its appearance, with reference to the distribution of undersize, slate and bone, it is also generally considered that such inspection furnishes a fair estimate of the percentages of impurities present and is, therefore, an indication of the efficiency of operation of the preparation equipment. However, the only positive method consists in a "double check"—analyzing the coal as it leaves the preparation equipment and also on the car. Unfortunately, that procedure cannot always be followed, for it would involve a large expense and might seriously interfere with breaker operation.

A few years ago it was necessary for one of the largest producers in the northern anthracite field to make hourly tests on the efficiency of a new type of separator. In addition to sampling the coal as it left the equipment, it was also decided to subject it to the usual on-car inspection. The results of these tests are given in the accompanying table and, while limited to a small tonnage and to but one size of coal, it is believed that they are among the first results of this kind to be published and that they fairly present the difficulty, if not impossibility, of making more than roughly approximate analyses by car inspection.

The at-separator tests were made by the research chemist of the company, who took samples of the "coal end" of the separator at intervals not exceeding one hour. These samples were then hand-picked for slate and bone, and screened for oversize and undersize. The

results thus obtained were averaged for each day's operation. The finished coal was then loaded into cars, and the on-car tests made by the inspection department of the company, which reported the results to the research chemist each day. The weights of coal given represent the total daily tonnage from the separator.

In only one instance did the on-car tests show a higher content of slate than those made at the separator. As an average, the former tests gave but little more than 60 per cent of the true slate content. The average proportion of bone as indicated by the car inspections was only about 22 per cent of that determined by the tests at the separator, and in no case was the percentage of bone less on the car than at the separator.

Although these tests were made shortly before the strike of 1922, the progressive increase in the slate and bone content, as indicated by the analyses at the separator, can more probably be attributed to experimentation with the preparation equipment than to any desire

Inspection Tests of Chestnut Coal, on Car and at Separator

Date 1922	No. of Cars	Weight of Coal Tons	Slate per Cent On Separator	Bone per Cent On Separator	Oversize per Cent On Separator	Undersize per Cent On Separator	Remarks
Feb. 20..	1	37.90	1.00	1.08	0.50	1.25	Condemned for culm; No lip screen.
Feb. 21..	1	33.50	1.00	0.75	1.00	1.83	Passed.
Feb. 22..	1	38.75	1.81	2.75	Condemned appearance; badly mixed.
Feb. 27..	1	37.90	1.00	1.11	1.00	3.14	Passed, appearance good.
Feb. 28..	1	39.85	1.00	2.43	0.50	4.00	Passed, good.
Mar. 1..	2	79.60	0.75	2.75	0.50	4.12	Passed.
Mar. 7..	2	80.05	1.38	3.10	0.75	4.70	Passed.
Mar. 9..	1	41.25	1.00	1.50	1.00	3.70	Passed.
Mar. 10..	1	40.60	2.00	2.60	1.75	6.20	Passed.
Mar. 11..	2	80.15	1.00	2.10	0.75	3.00	Passed.
Mar. 15..	2	80.80	2.25	2.70	1.75	5.00	Passed.
Totals and averages	13	39.52	1.29	2.12	0.90	3.97	Excluding condemned cars.
Average of last 8 cars	8	40.36	1.53	2.40	1.20	4.52	Average of last 8 cars

on the part of the company to increase its output. Even allowing for the inaccuracies of car inspection, the figures on oversize and undersize unmistakably indicate a decrease in oversize and a corresponding increase in undersize in the coal on the cars—the average decrease in oversize amounting to about 16 per cent, whereas the average increase in undersize is about 24 per cent. This shows the breakage and disintegration (particularly in the domestic sizes) occasioned by conveyance and loading and indicates that here is another point in coal preparation where improved methods will result in an improved product and, therefore, an increased profit.

The table is of interest also in that it shows that the quality of coal shipped before the standards of March, 1925, were adopted, was essentially the same as it is now. Based on the new standards possibly three cars passed in the accompanying table would have been condemned for excessive quantities of undersize and one of these three would also have been condemned for excess bone. That is, about 22 per cent of the coal on which these tests were run would have been "re-worked" under present conditions.

X-Ray Examinations Reveal Distribution and Character of Constituents of Coal

Radiographs Indicate Whether Ash Is Colloidally Dispersed Over Entire Mass or Exists Mainly in Bands That by Ordinary Light Might Be Invisible—Calcite in Mass Distinguishable from Pyrite

By Ancel St. John

Consulting Physicist, New York City

BECAUSE BODIES of different composition have different powers of absorbing X-rays, photographs made with the aid of these rays indicate the different degrees of absorption and hence something as to the composition of the body. In examining a complex substance such as coal or coke the distinction between the pure or nearly pure coal substance and the ashy material is clearly marked, and this has furnished the basis for an expanding technique, the fundamentals of which it is the purpose of this paper to explain.

The consideration of this subject naturally divides itself into two parts: Radioscopic analysis of the distribution of the constituents through the body of the coal and diffraction analysis of the state of association of the elementary components. In this article the text concerning radioscopic analysis has been drawn almost entirely from the writings of Kemp and his associates and the illustrations have been furnished by him, the text and illustrations concerning diffraction analysis being taken

from that author's at present unpublished researches.

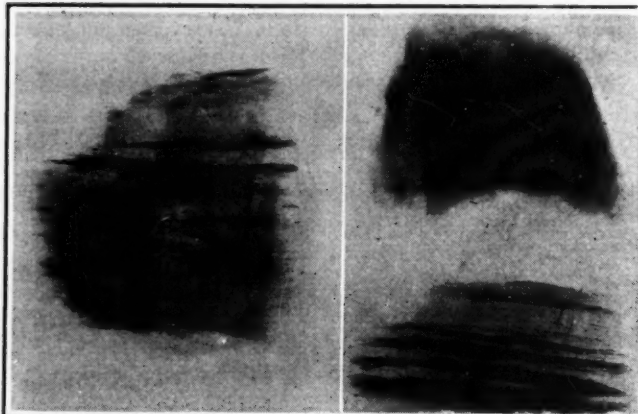
Before proceeding further it is well to recall the nature and some of the properties of X-rays, as well as our present conception of atomic structure. According to the accepted theory, atoms are composed of

electrically - charged particles. A positively-charged center, called the nucleus, is surrounded by a number of negatively-charged particles, called electrons.

These are believed to move in orbits forming a sort of miniature solar system about the nucleus. The mass and charge of an electron is the same no matter with what atom it may be associated. The mass and charge of the nucleus and the number of associated electrons are proportional to the atomic number of the element. In addition to their normal

motions about the nucleus the electrons may vibrate in other ways if the atom is agitated sufficiently, and in so doing may set up electro-magnetic or "light" waves.

The force between the nucleus and an electron decreases with increasing distance between them but increases with increasing charge on the nucleus. It may be shown that as this force increases the work



Figs. 1 and 2—Radiographs of Uncrushed Coal

Fig. 1 (left) is a radiograph of a lump of coal and Fig. 2 (right) is a similar reproduction of two cores from boreholes sunk through anthracite seams. The light areas show pure carbonaceous material; darker areas, calcium, iron and other minerals of high atomic weight.

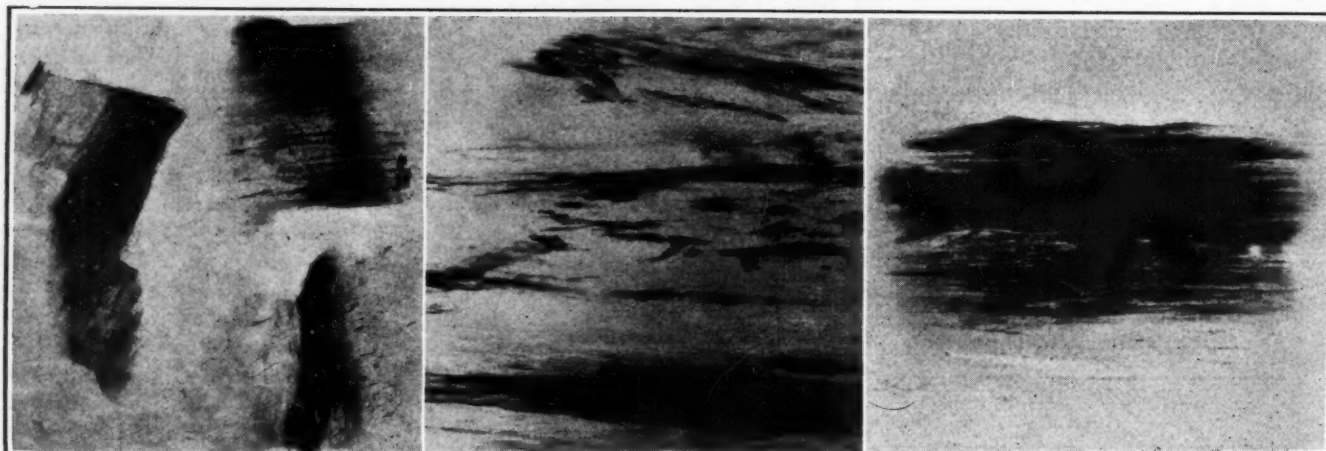


Fig. 3 (Left)—Radiograph of Three Pieces of Bituminous Coal. Fig. 4 (Center)—Another Radiograph, Also of Bituminous Coal. Fig. 5 (Right)—Radiograph of Fragment of Anthracite

The first and last of the three illustrations show coals that cannot be well benefited because the impurities are quite generally distributed. The bituminous coal

in the center panel (Fig. 4) could be freed from much impurity by crushing and washing. One advantage of the radiograph is that it shows clearly to the eye what the

results of the float-and-sink tests can convey only to the imagination. It, therefore, gives a visual indication of a conclusive chemical fact.

Abstract of paper presented at the Pittsburgh Meeting of the American Institute of Mining & Metallurgical Engineers, Oct. 5-9.

required to agitate an electron and the frequency of the resulting vibration both increase, much as a short, stiff spring requires more energy to set it in motion and vibrates more rapidly than a long, flexible one.

Visible light is produced when agitation of the atom displaces one of the electrons which form the outer portion of the atom; X-rays arise when the inner electrons are displaced. This displacement is usually accomplished by the impact of a free electron moving with speed enough to penetrate to the interior of the atom. The X-rays given off in this manner have wave-lengths peculiar to the atom and are called the characteristic X-rays of the element. The stoppage of the free electron also sets up a series of waves known as the general or independent X-rays, of various wave-lengths exceeding a minimum determined by the speed of the impinging electrons.

In this country the X-rays used for technical purposes are usually produced in the Coolidge type of X-ray tube. This consists of a highly-evacuated, thin-walled glass bulb containing a spiral tungsten filament, sometimes called the cathode, and a heavy metal block, usually tungsten or molybdenum, sometimes called the target or anode.

The supply of free electrons is obtained by heating the filament with an auxiliary current, as in a radio tube. The speed is imparted to them by impressing the voltage of a high-tension transformer between the filament and target, and using suitable means, such as a rotating high-tension switch, a rectifying tube, or the rectifying action of the X-ray tube itself when the target is kept cool, to insure the flow of electrons only from filament to target.

X-rays are only slightly visible to the human eye and produce serious physiological effects when they fall on any part of the body frequently or for a long time, hence some other method than direct vision must be used for detecting them. When they traverse a substance part of their energy is absorbed, part is scattered and the rest passes through. Some of the absorbed energy may be given off again as longer X-rays, known as secondary rays, or

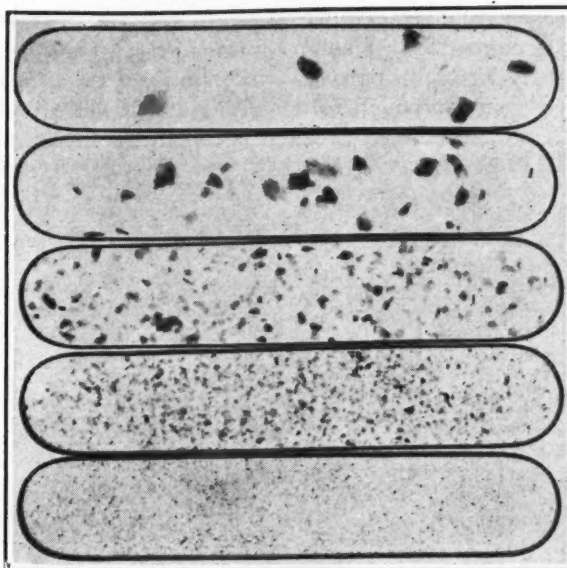


Fig. 6—Radiograph of Samples of Coal of Five Different Sizes

The ash in coal is always unevenly distributed among the various sizes, not always in the same manner. This radiograph shows just where the impurity goes and therefore just where it must be hunted out for removal.

atomic weight of the target but principally upon the voltage across the tube and the composition, density and thickness of the absorber.

In general, for a given voltage the absorption increases rapidly with the atomic weight of the absorber; for a given absorber it decreases rapidly with the voltage. When an appropriate voltage is used it is possible to determine the distribution of abnormal material such as ash in coal, either by observing a fluorescent screen in a darkened room or by a photographic record. The latter is more sensitive and reliable.



Fig. 7—Distribution of Ash in Piece of Coke

Coke being carbon absorbs X-rays but little, just like coal. Carbon is of a low density and the rays pass through it with little obstruction. The earthy minerals resist the X-rays more and the metallic minerals still more. It is the iron rather than the sulphur in the pyrite that renders it so opaque to X-rays.

sometimes as visible light or fluorescence. In some cases part of the absorbed energy may cause physical or chemical transformations, such as ionizing a gas or activating a photographic emulsion. The intensity of such effects depends upon the intensity of the rays producing them and may be used as means of detecting or recording the radiation.

The amount of the absorption and scattering depends upon the wave-length of the X-rays, upon the number and arrangement of the electrons in the absorbing atoms, and upon the number of atoms of each kind encountered, but is practically independent of the way the atoms are arranged. Expressed in another way, it depends somewhat upon the

Soon after the discovery of X-rays in 1895 by Roentgen, Prof. H. Couriot published an important article which laid the foundation for all subsequent work on radiosopic analysis of coal and coke. In 1899, J. Daniel described attempts to determine the ash content by radiosopic methods. A paper by Garrett and Burton in 1912, and the discussion thereof by a number of eminent authorities showed that X-ray examination could supply valuable information as to the distribution and mode of aggregation of ash in coal and as to the origin and structure of coal and coal seams.

Later C. Iwasaki used radiosopic methods in selecting samples of coal to be submitted to various tests and made a series of radiographs of thin sections to supplement microscopic analysis. In 1923 Professor Henry Briggs presented radiographs of Welsh anthracite prepared by Kemp and described a method for

isolating ash material from carbonaceous matter so as to determine their respective ash contents. Finally C. N. Kemp and his associates, in a series of papers beginning in 1924, described methods and equipment for making rapid and reliable determinations of the distribution of ash materials in the mass of coal or coke, and for evaluating the ash in a sample.

The radioscopic analysis of coal and coke is based upon the variation of absorbing power with composition. Coal is essentially a mixture of combustible organic constituents made up of finely divided free carbon, hydrocarbons and substitution complexes plus non-combustible mineral matter such as calcite or pyrites.

Carbon, hydrogen and oxygen are all very transparent to X-rays. Sulphur and calcium are much less so, and iron is relatively opaque to the wave-lengths used. Hence in a radiograph of a lump of coal (Fig. 1) the light areas indicate relatively pure carbonaceous material, darker areas indicate the presence of some sulphur, calcium, iron or other elements of higher atomic weight than carbon, and the black portions are dominantly of high atomic weight.

The possibilities of radioscopic analysis are at once evident. During the geological exploration of a coal seam, radiographs of the borings, such as the anthracite cores shown in Fig. 2, will give valuable information as to the character, quantity and distribution of combustible and non-combustible constituents. So also will radiographs of lumps, such as the pieces of bituminous coal illustrated in Figs. 3 and 4, or the fragment of anthracite in Fig. 5. During the preparation of the coal for market further information as to the distribution of the

non-combustible material in the different sizes can be obtained from pictures of graded samples (Fig. 6), and, similarly, the distribution of ash in coke is thoroughly disclosed by the X-ray camera, as shown in Fig. 7.

The method is particularly valuable in the analysis and control of coal-washing processes. Kemp and McLaren have directed special attention to this and have developed the technique and equipment to a high degree of efficiency. The method consists essentially in using a narrow jig with parallel faces of a material fairly transparent to X-rays. This is placed transversely in the X-ray beam, filled with the sample to be tested, jigged and examined with a fluorescent screen or recorded on a photographic film.

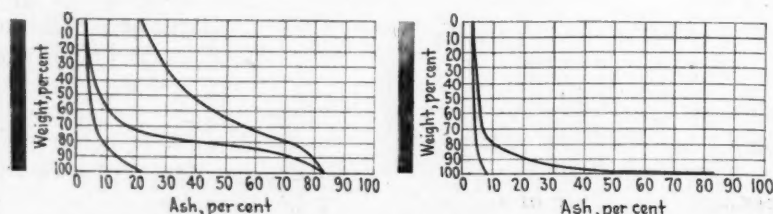
As the cell is of uniform thickness the picture will be slightly and uniformly mottled if the contents are clean, pure coal, but will show darker spots where ash is present. The appearance of such a sample of washed pea coal before jigging is illustrated in Fig. 8a. Even the most inexperienced can detect a considerable quantity of ash still present.

Fig. 8b shows this sample after jigging, with the major portion of the ash concentrated at the bottom. The occasional dark flecks in the coal are evidently due to streaks of ash material within the lumps of coal, constituting the so-called intrinsic ash. The rest

of the coal was removable but had not been taken out. Fig. 8c shows the appearance of a sample of the ash or discard that was removed from the jig before the radiographic tests had been used to determine the character of the work. Fig. 8d shows this sample after jigging. Evidently some good coal is discarded.

Ash-characteristic curves are outside the scope of this paper, but are treated at length in a paper by McLaren.* Briefly, the sample is jigged in a suitable hand jig until "effectively arranged in an ideal washing bed." Layers of this bed are removed successively, dried, weighed and incinerated. The percentage of ash in each layer is then platted against the percentage weight of the layers, reckoned downward.

In Fig. 9 the middle curve represents the actual ash content of the corresponding layers. The left-hand curve is derived from this by dividing the total area under the



Figs. 9 and 10—Curves of High-Ash Coal Before and After Washing

In Fig. 9 (left) the middle curve shows the average ash content for various percentages by weight. The left curve shows the average ash content in all coal above a given percentage of weight, that is, above the given level. The right curve shows the average ash content in all coal below a given percentage of weight, that is, below a certain level. In Fig. 10 (right) the right curve shows the average ash content for various percentages of weight and the left curve the ash content in the product when any given percentage of the coal is retained. Radiographs show ash contained at any given coal level.

*William McLaren: "The Scientific Control of Coal Washing by the Combined Application of Ash-Characteristic Curves and X-Ray Examination." Trans., Institute of Mining Engineers (June 1925).

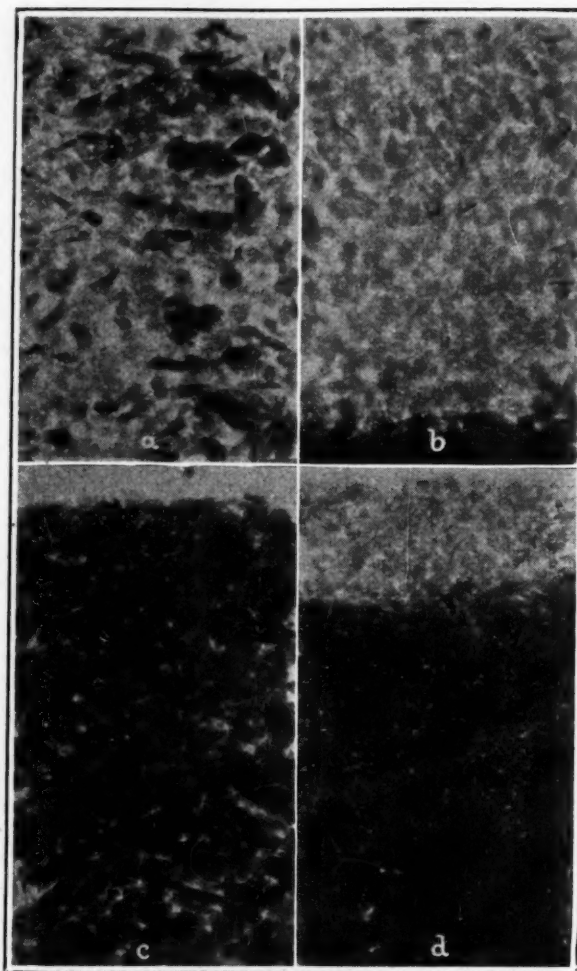
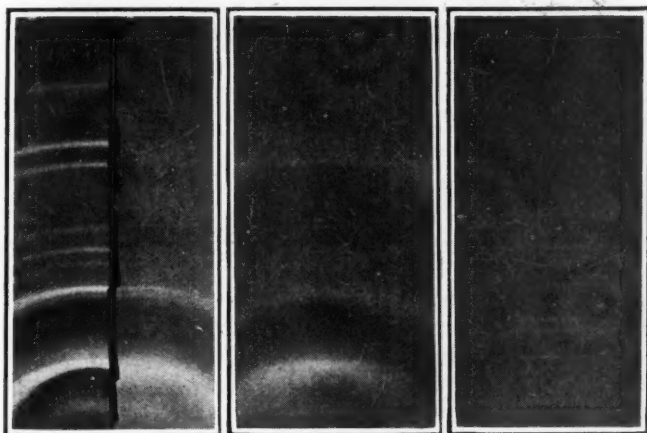


Fig. 8—Radiographs of Washed Pea Coal and of Reject from Washing

(a) Sample before jigging; (b) same sample after jigging. The major portion of the ash in the jigged pea has fallen to the bottom of the jig. (c) Ash or discard before jigging; (d) discard after jigging. Evidently there is a stratum of coal of better quality in the discard than can be found in any part of the washed pea.

ash curve down to a certain level by the weight of material down to that level. It thus represents the average ash content of the portion of the sample above the level in question. The upper end of this curve coincides with the upper end of the ash curve and represents the intrinsic ash.

The right-hand graph is obtained similarly by dividing the area above the ash curve by the weight of material below the level. It consequently represents the average ash content of the lower portion of the sample. The lower end of this graph coincides with the end of the ash curve and represents the removable ash. The upper end of this graph and the lower end of the left-hand curve both represent the average ash content of the whole sample. The radiographic record of this bed is shown in the extreme left for the sake of comparison. The co-ordination between the top of the ash zone in the radiograph and the horizontal portion



Figs. 11, 12 and 13—Diffraction Patterns Made by Graphite, Anthracite and Ash of Bituminous Coal

The two patterns in left panel are for graphite and Jeddo coal respectively, the pattern in the center panel is for Jeddo coal with cleavages at 45 deg. to the horizontal and that in the right panel is for the ash from bituminous coal.

of the curve is notable. Fig. 10 depicts the corresponding curves and radiograph for the coal after washing.

To point out the possible uses of these methods in actual practice I quote from a letter by Mr. Kemp:

Among the radiological applications which have been developed by myself and my colleagues during the past few years, the following may be of interest:

1. Examination of bore cores as auxiliary to usual test methods.

2. Fundamental surveys of coal for the determination of washing characteristics.

3. Examination of screened coal and fines as to the concentration of dirt in particular size categories.

4. Examination of washery products by laboratory jig test.

- a. The determination in the washed product of the remaining free (removable) dirt in excess of an allowable percentage.

- b. The determination in the discard of the quantity of good coal in excess of an allowable percentage.

5. Examination of the general character of the coal in specimens of an average thickness of about 2 in., or, where necessary, in specially cut slices of a uniform thickness of about $\frac{1}{2}$ in.

6. Control of coal washing, based on the results of prior fundamental examination.

7. Stereoscopic examination of cokes and carbonization products as to structure and free-ash distribution.

The feature of these tests is their rapidity and the precision of the information they provide. They furnish also a visual interpretation of analytical data, and have an additional value for purposes of comparison and record.

These tests valuably supplement the information which coal users usually determine for themselves, that is, average ash content and calorific value, because they indicate what proportion of the ash so determined could and should have been removed at the coal washery, and the possible savings are sufficiently obvious.

X-RAYS SHOW DIFFRACTION

It has been shown that X-rays can do more than disclose the distribution of materials in this way. In 1912 and 1913 the work of Friedrich, Knipping and Laue and the Braggs showed that X-rays are electromagnetic vibrations similar to light waves but so much shorter that their wave-lengths are of the same order of magnitude as the diameters of atoms and that they obey many of the laws of visible light.

In particular they showed that they give rise to diffraction phenomena when they impinge upon an orderly array of atoms such as exists in a crystal, just as visible light does when incident upon an orderly array of small obstacles such as the threads of an umbrella cover. And, just as the pattern observed when a distant light is viewed through the umbrella depends upon the character of the light and the size and arrangement of the threads in the cloth, so the pattern produced when X-rays traverse crystalline material depends upon the character of the X-rays, the size and arrangement of the atoms in the crystals, and the size and arrangement of the crystals themselves.

The method was extended from examination of single crystals to the study of powdered crystals and aggregates of fine crystal grains by Debye and Scherrer and A. W. Hull. In the modified form of the powder method, now the usual practice in this country, the strongest of the characteristic wave-lengths from a molybdenum target is used to illuminate a specimen having a predetermined portion lying on the axis of a cylindrical surface. A photographic film is spread on the surface, and the pattern is recorded as a series of lines or bands, one for each set of parallel planes that exist in the atomic arrangements present in the material under examination.

DIFFERENT SUBSTANCES GIVE DIFFERENT PATTERNS

Fig. 11 is a pattern from the author's collection and shows powdered Jeddo anthracite on the right compared with a standardized sample of graphite on the left. The broad diffuse bands indicate that the carbon material is in a state of colloidal dispersion, probably in a hydro-carbon binder of low volatility. The sharp faint lines in the coal pattern are due to the ash, and if compared with the patterns of calcite, pyrites or other possible ash constituents would disclose the character of the ash. These ash lines are somewhat more pronounced in Fig. 12, which is the pattern from a small lump of the coal. Fig. 13 is the pattern of the ash from a sample of bituminous coal.

Close comparison of the negatives shows that it contains other constituents than those discernible in the Jeddo coal. The lump used in making Fig. 12 had its cleavage planes at 45 deg. to the slit limiting the X-ray beam. The greater intensity of the left end of

the first band and the right end of the second suggests that the colloidal particles are more or less flaky, like embryo flakes of graphite, and have been preferentially oriented to some extent by pressure in the coal bed.

This is borne out by Fig. 14a, in which the pattern due to a fine circular beam has been recorded as a series of concentric circles on a film at right angles to the beam. The greater intensity of the first band in the 45-deg. direction is marked. The extent to which such preferred orientation can be developed is illustrated in Fig. 14b, the pattern from a sample of the standardized graphite which has been submitted to a pressure of several tons per square inch. It is interesting to note that in Fig. 14c, the pattern from bituminous coal similarly compressed, and in Fig. 14d, the pattern from a fragment of bituminous coal, there is no such evidence of preferred orientation.

Possible application of diffraction analysis to coal problems will undoubtedly suggest themselves to the reader. Among those offering promise may be mentioned: (1) Determination of the state of combination of the elements comprising the ash. (2) Determination of the relative proportions of the various ash constituents. (3) Study of modifications in ash composition during combustion in the furnace. (4) Fundamental study of the carbonization characteristics of coals.

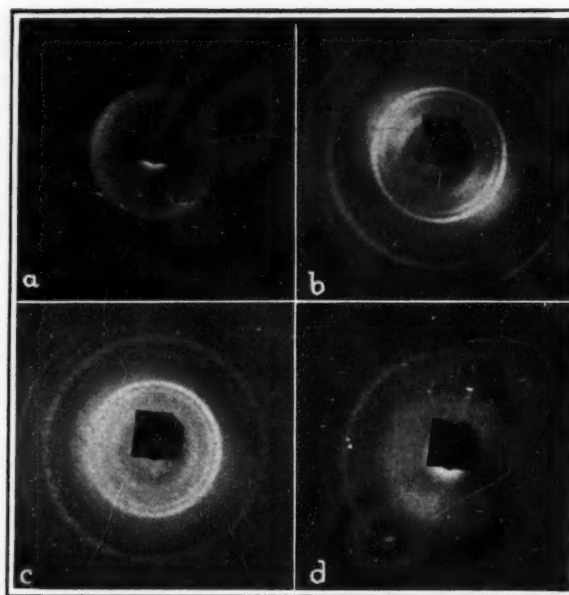


Fig. 14—"Pinhole" Patterns, Coal and Graphite

The pressure axis is downward from left to right. (a) Jeddo coal. (b) Graphite that has been submitted to a pressure of several tons per square inch. (c) Artificial graphite from compressed bituminous coal. (d) Fragment of bituminous coal.

Bureau of Mines Defines a Gassy Mine

At the meeting of the American Institute of Mining and Metallurgical Engineers, G. S. Rice, chief mining engineer of the U. S. Bureau of Mines, announced the definition of a gassy mine. This definition has been awaited with much interest, especially by the safety committee of the Rocky Mountain Coal Mining Institute. It applies to the whole area of all mines, any part of which is on the public domain of the United States. Consequently it will be of wide application in the western part of this country. The safety committee of the R. M. C. M. I. has been hopeful that the institute would adopt this definition without exception as the codes of rules to be recommended at all mines in the Rocky Mountain area. The statement follows:

"The U. S. Bureau of Mines believes that all coal mines are potentially gassy; but for purposes of administration in respect to prevention of explosions and fires, the Bureau recommends the following classification:

"Class 1 coal mine—A practically non-gassy mine in which flammable gas in excess of 0.05 per cent cannot be found by systematic search.

"Class 2 coal mine—A slightly gassy mine in which (a) flammable gas has been found,* but in quantity less than 2 per cent in still air in any active or unsealed-abandoned workings; or (b) flammable gas can be found, but in quantity less than 4 per cent, in some place from which the ventilating current has been shut off for a period of one hour; or (c) flammable gas can be found,† but in quantity less than $\frac{1}{4}$ per cent, in a split‡ of the ventilating current; or (d) flam-

mable gas is found in quantity greater than specified rate§ of not more than 25 cu.ft. per minute.

"Class 3 coal mine—A gassy mine in which flammable gas is found in quantity greater than specified for a Class 2 coal mine.

GENERAL NOTES REGARDING DECISION NO. 3

"(A) Flammable gas found in coal mines is, with rare exceptions, methane. In coal-mining fields where natural gas is found in lower geologic horizons by deep wells which pass through or nearby the coal mines, there have been rare instances of a leakage from the well. Natural gas is chiefly methane; that constituent almost always forms more than 85 per cent of the whole, but it usually contains ethane, propane and traces of butane also. Therefore if the latter gases are found in mine air it is an indication of leakage. The lower limit of explosibility of methane-air mixture when there is turbulence is 5 per cent and of natural-gas-air mixtures with about 10 per cent ethane and associated hydro-carbon gases is 4.6 per cent. The limit therefore varies with the character of mixture.

"(B) To determine the proper classification of a coal mine, it is advisable that systematic testing and sampling be done at least three times in a period of not less than 72 hr. All tests and samples of the mine air, except one, must show an inflammable-gas content less than the maximum limit of the class to which the mine is assigned. In other words, a tolerance of one test or analysis may be permitted to provide for a mistake or a very exceptional occurrence.

"(C) When a new mine is being opened in a coal field where existing mines are generally gassy, it is common sense to assume that similar conditions will be found in the new mine, and its development and equipment should be based upon the expectation that it will be assigned to Class 3."

§Determined by sampling, analysis and ventilating-current measurement.

*By employing an approved flame safety lamp, with flame drawn low, or by employing an approved gas detector, or by sampling and analysis with an approved gas analytical apparatus.

†By sampling and analysis with an approved gas analytical apparatus, or by employing an approved gas detector.

‡If but one continuous ventilating current is employed in a mine this shall be considered a "split" for the purpose of this definition.

Dipping and Baking Avoids Armature Troubles

DIPPING THE COILS of an electrical machine in an insulating varnish and baking them before putting them in place, also the dipping and baking of the complete winding, has become quite general practice in manufacturing as well as in repair shops, says H. M. Day in a paper before the American Electric Railway Association, and recently printed in *Power*. Lately, the Power Committee of the National Electric Light Association issued a report on "Baking Armatures and Insulated Coils in Electric Ovens." They stated that the practice first demonstrated its value in making savings and promoting reliability of electrical equipment on railway motor armatures. An increase of 75 per cent in the life of motors that have been dipped or baked is not uncommon. Besides this direct saving there is the great gain due to freedom from failures and breakdowns in service, with a consequent loss of production.

The reason for the longer life and increased reliability of coils and windings that have been dipped and baked is that the insulating varnish, properly applied and baked, forms a hard coating, impervious to moisture, which fills all the cracks and crevices, holds loose coils and laminations in place, restores coil insulation to good condition and prevents the entrance of dirt.

Proper treatment of coils and windings involves three essentials: 1. Use of suitable baking varnish. 2. Full impregnation of the coils. 3. Uniform baking of the coils and armatures. Although the paper prepared by Mr. Day referred principally to railway armatures, it contained many details applicable to electrical mining equipment.

DIPPING PROTECTS INSULATION

The object of dipping an armature in an insulating varnish and then baking dry is to encase the wires and coils in a hard gum substance that will, by completely surrounding the coil, prevent chafing, lessen vibration and repel moisture and oil, all of which would, sooner or later, break down the original insulation and cause grounds or short-circuits.

The process of dipping and baking is neither difficult nor complicated, but it is exacting, and certain stages of the treatment must be carried out without deviation from proved standards. The three important conditions that must be observed are: First, the armature must be free from all dirt and moisture; second, all windings must be thoroughly saturated with varnish and the surplus drained off; third, the varnish must be baked dry.

Dipping in varnish an armature that is not clean and dry will defeat the purpose of the process, because dirt and moisture trapped in the windings by hardened varnish will quickly cause insulation breakdowns. All wires and coils must be thoroughly saturated with varnish to prevent open spaces which will allow accumulations of oil, dirt and moisture.

Finally, and undoubtedly most important, if the varnish is not baked on the coils are simply supplied with moisture before the motor has a chance to pick it up in service.

The paper details the method of cleaning the armature, giving the process for either compressed air or that of the gasoline tank. After the armature is cleaned, however, it should be placed in an oven and

kept for ten to twelve hours at a constant temperature just high enough to dissipate moisture. At the end of the preheating period, the armature must be allowed to cool off so as not to enter the varnish too hot. The correct temperature is from 130 to 140 deg. F., or when a workman can comfortably lay his hand on a coil. The reason for this is that if the armature is too hot, the varnish will be heated, become too thin and run off, leaving the armature with too thin a deposit of varnish.

VARNISH MUST BE THOROUGHLY APPLIED

There are many different opinions as to how the armature should be dipped, and whether it should be literally "dipped" at all; but there is one point about which there cannot be any argument, and that is that the winding should be thoroughly saturated with varnish. It makes little difference how the varnish is applied to the winding so long as it is thoroughly applied. The simplest and easiest way is to immerse the armature up to the commutator in a tank of varnish, pinion end down, for from five to ten minutes. This length of time will be sufficient to allow penetration to the bottom of the slots if proper precautions with regard to maintaining the uniform specific gravity of the varnish are strictly followed. The paper further details methods of watching the specific gravity of the varnish. It states that the specific gravity of the varnish is important on account of the tendency to form "pockets" of wet varnish.

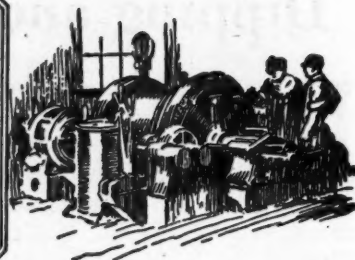
When the armature is drained, it should be placed in an oven in which the temperature generally recommended is not allowed to vary either below 239 deg. F. or above 257 deg. F., and kept there without interruption until the baking period is over. It is an excellent practice if the armatures are placed in a horizontal position to turn them every ten to fifteen minutes during the first hour before the varnish is set. This will prevent what free varnish is left from collecting in one spot.

The oven must be ventilated sufficiently to carry away the moisture and gases given off in the baking process without lowering the temperature, because the baking period should be uninterrupted. There are two types of baking varnish, one having a china-wood oil base, the other a linseed-oil base. Varnish with a linseed-oil base will not give as good results as a combination varnish containing a larger proportion of china-wood oil than linseed oil. This, however, is a matter for the operator to decide by the results obtained. The important thing is, however, to select a varnish that is known to be high grade and made for baking.

Electrically heated ovens will produce correct results. Ovens should be thermostatically controlled to insure a constant temperature during the baking period, because if controlled by hand and left to an operator, the heat control will be frequently forgotten or neglected. The most important things that are to be observed in the operation of baking and in the construction of a baking oven are: thorough insulation to prevent loss of heat through radiation and escape through cracks and openings; adequate ventilation to carry off moisture and gas; and accessibility and arrangement to cut down handling time.



Practical Pointers For Electrical And Mechanical Men



Switch Throw Operated from Remote Stand

So many types of switch throws have been used on light rail work that the type to be described, now in use at No. 4 mine of the West Virginia Coal & Coke Co., Omar, Logan County,

The idea is that of a blacksmith at one of the mines. Referring to the sketch, A is a bell crank with one arm connected to the switch rod and the other to the operating rod B and to one end of link C. Connected to the outer end of the link is a 20-lb. rail which is spiked at the one end

holds the points tightly in either position, the mechanism is simple and inexpensive, and a trailing movement through the closed side will not injure the points which return after the wheels have cleared.

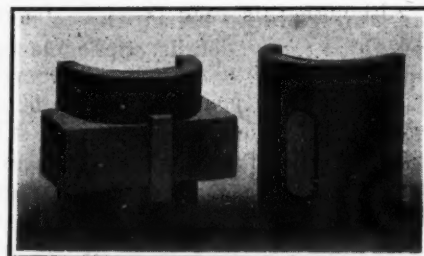


Throwing Switch

This is done from last car of empty trip after it has cleared switch and is on main line. The long switch-stand handle makes it easy to throw switch from moving trip.

New Type of Brass Prevents Journal Box Trouble

Marked improvements in the design and quality of journal boxes have been made in the last few years by several of the locomotive manufacturers. One common difficulty with some of the older types is that the long and severe service to which the boxes are subjected crushes them or causes them to be bowed in at the sides, which in turn shears the bolts.



Standard and New Type Brasses

The new type is at the left. The only change is that square bosses have been added to the sides. These prevent the journal box from bowing in under the stress of severe usage.

The first time the locomotive gets off of the track after this occurs the brass turns, allowing the axle to ruin the box by wearing directly upon it.

W. Va., may not be entirely new. Its operation has been so satisfactory that others of the same type are to be installed at Mines No. 4 and No. 5.

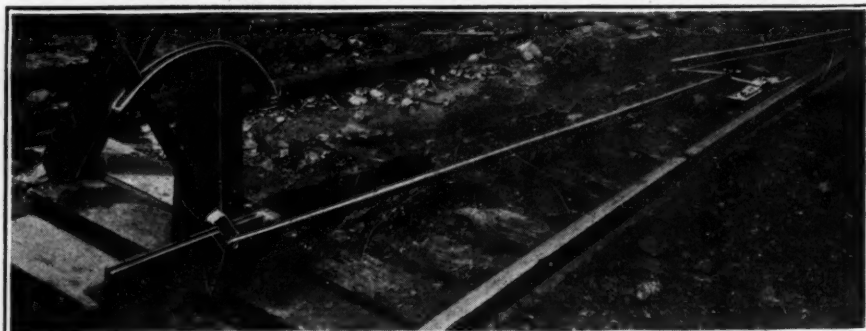
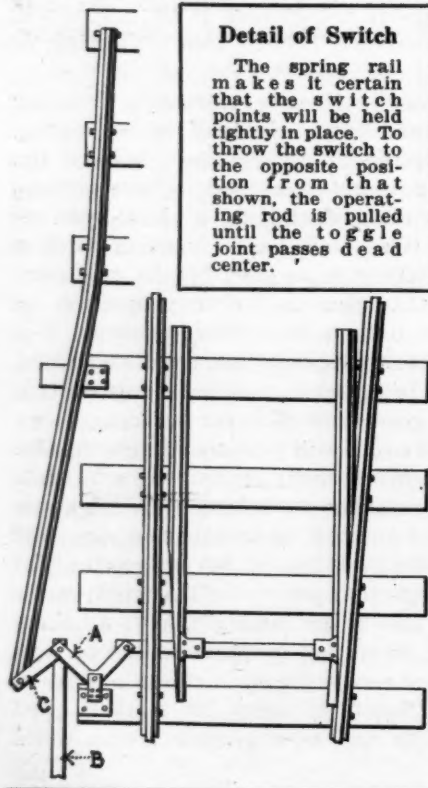
so as to form a spring acting toward the track.

The operating rod B extends to a pony stand located several feet from the end of the switch points. The relative positions can be seen in the illustrations. This enables the brakeman riding in the rear car of an empty trip leaving the tippie, to throw the switch to the loaded track for the next trip without stopping.

As explained by J. J. Corbley, superintendent of Mines No. 4 and 5, the switch has several other important advantages. The spring rail

Detail of Switch

The spring rail makes it certain that the switch points will be held tightly in place. To throw the switch to the opposite position from that shown, the operating rod is pulled until the toggle joint passes dead center.



Switch Point and Its Remote Operating Stand

A spring consisting of a 20-lb. rail and acting toward the track is connected by a short link to a bell crank, the other end of which is attached to the switch rod. The link and one arm of the bell crank form a toggle joint on the center of which the operating rod acts.

The accompanying photograph shows how the Chicago, Wilmington & Franklin Coal Co., operating in southern Illinois, has made a change in the design of its journal boxes, that practically prevents box distortion and its resultant troubles. The regular shape of brass is shown at the right, and the new design at the left.

When the brass with the square bosses or projections is installed in the journal box, the sides of the box are braced apart thus preventing any tendency toward bowing. The new brass of course costs more than the standard design, because of its extra weight. However, against this difference its proportionally higher scrap value should be credited.

Stores Many Armatures Conveniently

Proper storage for 50 to 100 armatures varying in size from 5 hp. to 150 kw. is somewhat of a problem in a shop where the room available is limited. The accompanying photograph shows a new rack for this purpose in the Omar shop of the West Virginia Coal & Coke Co.

Although this rack is 24 ft. long and over 7 ft. high it is built as a unit and can be moved if necessary. It now stands against the wall, but because of the clearance of over 6 ft. underneath at the high point, the floor space it occupies is utilized for the storage of other materials.

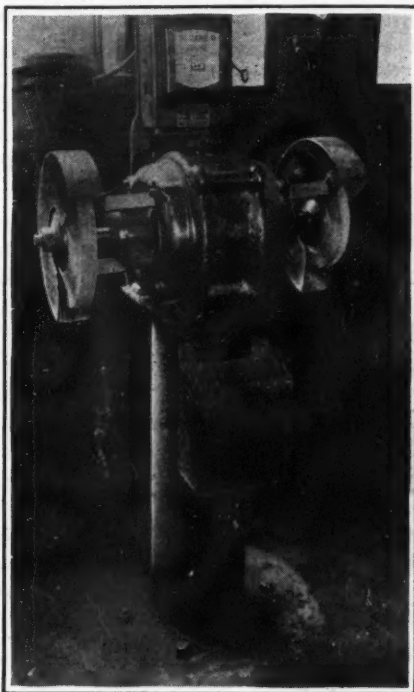
The rack, which is 9 ft. long measured on the slope, has a main frame built of 3x4-in. angles bolted together. The steps or brackets for holding the armature shafts are short pieces cut from the same stock. The sloping supports are spaced at various distances so as to accommodate armatures of all the sizes usually employed at the mines.

The capacity of this rack is approximately 80 armatures, and at the time that the accompanying

photograph was taken 63, including three 150-kw. converter armatures, were mounted on it. An overhead traveling crane is used in handling the armatures to and from this storage.

Attach Two Grinding Wheels To Motor

Autogenous welding as done by the oxy-acetylene and electric-arc methods has made it possible for the re-



Welding Makes Neat Job of This Assembly

The motor by which these grinding wheels are driven is rated at 5 hp. at 1,750 r.p.m. The pedestal is a pipe with welded flanges. The water box and grinding-wheel guards are also welded.

pair shop to do work which is comparable with a factory job. The illustration shows one of several two-wheel grinders that were made from type KT, 5-hp. 1,800-r.p.m. squirrel-cage motors in the Omar shop of the West Virginia Coal & Coke Co.

Changes to the motor consisted of the installation of a longer shaft,

closing the vent holes in the housings and the application of felt dust washers around the shaft on the outside ends of the bearing housings. Welding played the principal part in the construction of the pedestal, water box, guards and the support for the starting switch.

The pedestal is 8-in. pipe with steel flanges welded to top and bottom. Guards for the 12x1½-in. wheels were made by welding together three pieces of steel plate and attaching, also by weld, supporting arms which are held by the housing cap screws. The assembly is quite rugged and presents a neat appearance.

Should Wetted Motors Be Dried by Current, Baking or Rewinding

Operating men frequently have to dry motors that have been submerged in water and their methods of performing this job vary with the operative, says *Power*. Motors may be dried by passing an electric current through them, but this method cannot be recommended although many adopt it. The current tends to leak through the insulation between turns of the coils, and in this way copper is deposited in the insulation by electrolytic action. Cases are on record where motors that had been started after a bad wetting, could not be dried by baking so as to restore the insulation, the only remedy being to rewind the machine.

VENTILATED OVEN ESSENTIAL

Baking the machine in an oven of some kind is the best practice. It is essential that the oven be well ventilated in order to get rid of the moisture driven out of the windings. If the oven is not ventilated, it will be found impossible to dry the windings, and this is why difficulty is often experienced in restoring the insulation to normal. One of the best ways in which to check the progress of the drying process is by testing the resistance of the insulation. If it is found that it is slow in becoming normal after eight or ten hours' baking at a temperature of about 200 deg. F., it will be well to look carefully into the ventilation of the oven. Where machines have been submerged in water while running, baking will restore the quality of their insulation only with difficulty, and rewinding will usually be needed to put the machine in condition for service.

Armature Rack

This rack has a capacity of 80 armatures but when photographed it held only 63. This included three belonging to 150 kw. rotary converters. The rack is 7 ft. high and 24 ft. long. The slant height is 9 ft. thus affording ample space for armature storage.



Book Reviews

British Coal Problems and Systems Of Extracting Coal

Review by R. Dawson Hall

Interest in the British conditions of operation has been greatly intensified recently by the protracted strike in Great Britain. The new book by H. F. Bullman and Sir R. A. S. Redmayne entitled "Colliery Working and Management," published by D. Van Nostrand Co., 8 Warren St., New York City, will do much to give the American reader an intimate comprehension of British working conditions past and present, for both the authors take an interest in matters not strictly comprised in the narrower sense of the word "engineering."

FOR BRITISH READERS

This book is written for the profession. There is little time wasted in explaining what everybody in the industry in Great Britain and America already knows, though it may not be as new and enlightening in all its details to the British manager for whom it is prepared as to the American for whom it was only incidentally written.

Lest the average American reader who knows it to be difficult to translate an English mining book into American, for most readers no simple task, let me hasten to say that a good glossary is provided, a feature valuable not to Americans only but to British readers also, for the language of mining varies in England even more than it does here. Each shire has its own words specially coined in that particular district for its own individual needs. The mining regions of the British Isles had, at a remote time, even less in common with one another than our own mining regions have ever had, and it was often hardly safe for a mining man in one region to be found nosing out the secrets of another or even those of another mine in the same district. For every manager guarded his practices from his neighbors, feeling it bad policy to let them know how he operated his mines, cut his costs—yes, and even how he safeguarded his mines

from accident. Consequently, the lingo of the various mining districts varied greatly and continued so to do.

DEFINE THESE TERMS

That the value of a glossary is not imaginary, let the following words testify as a mere statement cannot: Backbye work, bait time, balks (meaning irregularities in the roof), bannocking, bat, batt or bass, bind (shale), black stone, blue metal, blue stone, bolt holes (meaning narrow roads), bondminder, bordways course and buttocker. Some Britishers whose American naturalization papers are scarcely dry can possibly give meanings for these words but the reviewer despite extensive reading of British mining books finds such terms as these perplexing, and there are many others like them, for only the words beginning with b have been listed. In this glossary under nearly every letter of the alphabet may be found peregrine terms demanding explanation.

WHY POINTED SHOVEL?

In such a compendious volume it is difficult to know what to choose for consideration: The multiplicity of the working methods, the reasons why the British use the tools they

do or some other totally different subject.

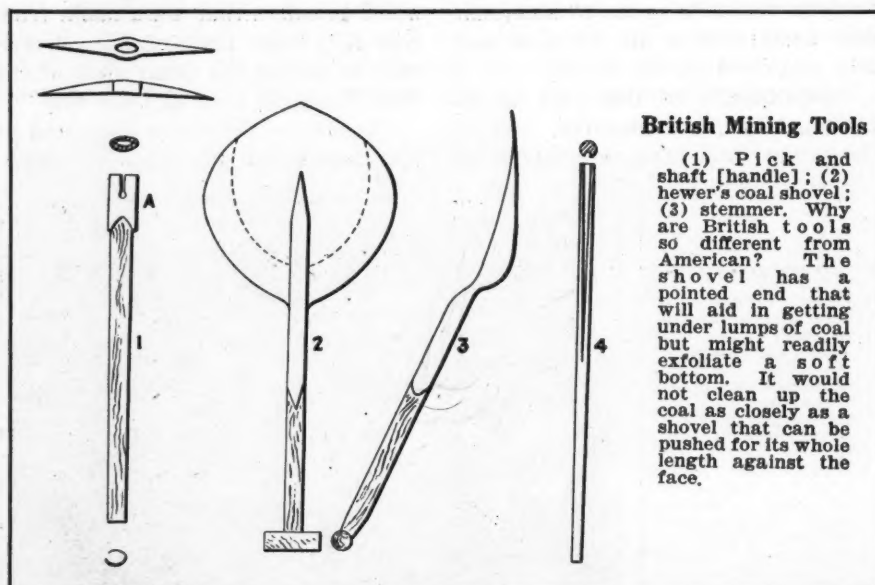
Why, for instance, is the coal shovel of the British "hewer" or miner so different from ours? Why is it pointed like a dirt shovel if the coal and floor are similar to that in this country? It is of course larger than a dirt-digging shovel and more capacious and it has a shorter handle, but it has a digging ability that we have not thought necessary or desirable to seek in designing a shovel for the use of our miners.

FOR ROCK OR COAL?

Will it resist the tendency to dig both clay and coal? Will it pick up pieces of the floor? Are the British right or are we? Or is it because British conditions are different in that the British miner expects to handle both rock and coal? William Littlejohn, of Price, Utah, is not alone in remembering the miner of certain parts of the British Isles as returning home at night looking more like a miller than a coal miner. The reviewer speaks without knowledge not having seen the shovel in use.

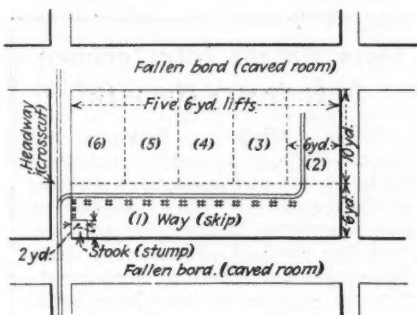
And again: Are the British justified in their method of attaching the pick to the handle or is ours the better way?

Several forms are contained in the book, such as wages, bills, cost sheets, royalty accounts and daily reports. There are also reports of overmen (foremen), back-overmen (night-shift bosses), firemen (fire-



bosses), master shifters (subforemen), master wastemen (airmen) and head-keepers or keekers (tippie bosses), also payrolls and pay notes (statements of individuals).

Looking at the last, one notes that there are as many deductions as perhaps at any American mine and more than at most. They include: Fire coal, laid out, doctors, P. R. fund,



Method of Removing Old Pillars at Seaton Burn

A skip (1) is driven up the side of the near room to the next crosscut leaving a stump for protection. Six-yard lifts (2, 3, 4, 5, 6) are taken off the pillar that remains in the sequence indicated. This gives good results where the cover is not over 900 ft. deep. "A larger produce [product] of round [large coal] is obtained when the coal is worked in a headways-direction or on end" [on the butt], say the authors. The illustration is somewhat modified from the original to aid in interpretation.

pick sharper, weighman, aged miners, infirmary, Dr. Barnado house, ambulance, priest, water, nurse, reading room, powder, band, health insurance and unemployment levy. Then there are several forms of additional compensation: Band, wet, ramble (draw rock), judd (the reviewer admits himself unable to define this charge), consideration, yard work (yardage), clay, minimum compensation and house rent. The last appears as a credit, being apparently a sum allowed where a man does not live in a house owned by the company and is given a certain compensation for that fact.

A DELUGE OF INK

This does not exhaust the list of forms by any means. A deluge of ink and much sharpening of pencils seems to go with the running of a British mine, but in that respect conditions in American mines are not greatly different. The various responsible employees at British mines answer a lot of questions which establish the fact each day that they have done all that their duties require. Some of these questions must be answered always with the same word "yes" or a carpeting or discharge will doubtless follow, but it is better thus, for a man who says he

has performed certain duties faithfully and has signed his name below his statement is less likely to shirk than if he made no such record.

The volume measures 6x10 in. and contains, altogether apart from its 32 inserted and mostly folded plates, 393 pages. Price of the book is \$15.

Some of our mining men are going abroad to see British practice for themselves. Here, within the exterior boards of this book, is a less expensive and wider tour than most would be able to make in Great Britain, though one possibly not affording so intensive an introduction as a trip to even a single mine would be.

Tennessee Has an Abundance Of Good Coal Seams

The Tennessee coal fields embrace two distinct physiographic areas, one known as the northeastern field and the other as the main Cumberland Plateau field. The coal beds in these two areas are distinct and different. The coal-bearing rocks of the Tennessee fields are of Pennsylvania age, but as the two areas have not been mapped in detail and systematically examined, the coals cannot be correlated with certainty.

CUMBERLAND PLATEAU

In the Cumberland Plateau coal field are the following mining districts: Tracy City, Bon Air, Crawford-Wilder, and Walden Ridge, in the last of which are included the mining districts of Soddy and Rockwood.

The workable coals of this field are all in the Lee formation. In the Tracy City district they are the Sewanee coal and the Battle Creek coal. In the Bon Air district the workable beds in downward order are as follows: Clifty, Ravencroft, Bon Air No. 2, and Bon Air No. 1. In the Walden Ridge district the workable coal beds in downward order are as follows: Morgan Springs, Soddy, Richland, Angel, Nelson, and Goodrich. Except the Morgan Springs coal, which has not been found over 24 in. thick, all of these beds are mined commercially at some place on Walden Ridge. The range of thickness of the other beds mined is 3 to 6 ft.

FOUR DISTRICTS IN NORTHEAST

In the northeastern coal field are the following mining districts: Jellico, Lafollette-Caryville, Clearfork, and Coal Creek.

The chief beds in this section are

the Coal Creek, 3½ to 6 ft. thick, which is mined extensively for steam coal, and the Jellico, which is noted as a source of domestic coal. The other beds which lie higher up the mountain sides will be worked more in the future as the lower beds are exhausted.

SEWANEE COAL

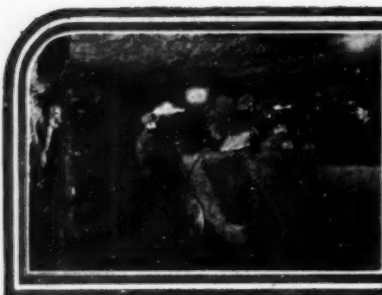
The coals of the Tracy City district have always been noted for their coking qualities. Sewanee coal comes from this district. The coals of the Bon Air and Crawford-Wilder districts make excellent domestic and steaming fuel. The coals of the Walden Ridge district are suited for both coking and fuel.

The greater part of the coal mined in Tennessee comes from the northeastern field.

Information in regard to the topography and geology of the Tennessee coal fields, the mining methods employed in the different fields, and the analyses and heating values of numerous coals is contained in Technical Paper 356, which is the ninth of a series of technical papers dealing with the characteristics of the coals mined in the different states. Reports previously issued in this series related to the coals of Iowa, Kentucky, Ohio, Utah, Alabama, Virginia, Missouri, and Pennsylvania.

Copies of Bureau of Mines Technical Paper 356, "Analyses of Tennessee Coals," can be obtained from the Superintendent of Documents, Washington, D. C., at a price of 15c.

PIT AND QUARRY HANDBOOK, 1926, an encyclopaedia of pit and quarry operations, has been published by the Complete Service Publishing Co., of Chicago, Ill., under the editorship of H. W. Munday. It covers all phases of the subject from geology, through plant design, drilling and blasting, stripping, loading and transporting, crushing, grinding and pulverizing, elevating and conveying, screening and separating, washing and drying, storing, dredging and pumping to fire protection, cost accounting, insurance, shipping and accident prevention. Other subjects are power-plant operation, powdered coal, power transmission, burning, waste heat recovery, clinker handling, hydration of lime, lubrication and production statistics. There are 573 pages measuring 5½ x 8½ in., but this includes many pages of advertising scattered between the various sections of the book. The price is \$5.



News Of the Industry



Fatuity of Force in British Strike Emphasizes Need for Prompt Accord On Soft-Coal Wage in United States

By Paul Wooton

Washington Correspondent of Coal Age

The British coal strike has demonstrated anew the folly of trying to settle questions of labor relations by force. The evident failure of the strike in Great Britain, however, lends a new point to the suggestion that negotiations for the new wage agreement in the bituminous fields of the United States should begin at the earliest possible time.

In the Jacksonville wage agreement the contracting parties bound themselves to reassemble in February, 1927, at Miami, at the call of the president of the union and of the chairman of the joint conference. As reported in this correspondence in the issue of Sept. 30, there is a feeling in administration quarters that American business should not be subjected to the delay and the uncertainty that would be involved in waiting until that late date. It is held to be in the interest of coal consumers and in the interest of miners and operators that the joint conference should be convened at the earliest possible date, or in the event that this is not practicable to arrive at some informal understanding that would remove uncertainty.

Delay Breeds Uneasiness

The country has gone through these experiences often enough to make it perfectly plain what will happen if no understanding is reached before February. Consumers will feel uneasy and will begin to accumulate stocks. It is predicted that no less than 70,000,000 tons will be put in storage in anticipation of a possible break. Even should no strike eventuate, production would have to drop to 5,000,000 tons a week and stay there for two months, at least, simply to liquidate the excess stocks.

EDITOR'S NOTE.—The foregoing Washington letter reflects certain views of official Washington. Due to the fact that policy as a rule prevents government officials from permitting their views being quoted directly, the authority for these reports is necessarily somewhat vaguely referred to. The views reflected are not those of any one group of officials, but of different men, in the legislative and executive departments. There is no necessary connection between their views and COAL AGE editorial policy; neither do they necessarily represent Mr. Wooton's personal views. It is felt that the opinions thus faithfully reflected will be of great interest to the industry. Where opinions are cited from sources outside of the government, the source will be specifically stated.

Although such a situation produces a sense of artificial prosperity in the industry while coal is being purchased for storage, the reaction afterward is like that of a narcotic when the effect wears off. This was just what happened in 1924. If a suspension occurs the effect is even worse.

American business is fed up on these stoppages. It is less and less patient with those who cause them. To precipitate a coal strike at a time when the business machine has attained a higher speed than ever before; when peace reigns everywhere else; when railroad workers and managers just have devised machinery for wage adjustments which promises to abolish strikes, would arouse militant resentment.

Events of the last year, it is believed, will make the attitude of mine labor more conciliatory. Twice within twelve months the strike has been resorted to by the strongest two blocs of coal miners in the world—the anthracite workers in the United States and the mine workers of the United Kingdom—and each group has been disillusioned. The anthracite strike in 1925 and 1926, in effect, was a defeat for the mine workers because they failed to win the concessions they confidently expected. The British coal strike, even when reinforced by the calling of the general strike—the greatest labor demonstration ever staged in an industrial nation—has failed.

Leaders Likely to Welcome Peace

With these examples before them the workers in the bituminous fields of the United States surely will be less aggressive and will be more open to reason. One does not have to be in the confidence of the union to venture the opinion that the leaders will be enormously relieved if they can find any peaceful way out of their difficulties. On the other hand, the results of the British strike impress on all employers the tremendous costs of attempts to settle labor disputes by force.

The victory which the British owners have won is in some sense a Pyrrhic one. They have lost six months production. Their markets have gone to their most powerful competitor, who has been quick to nail down the business for some

Government Interference In Industry Harmful

Prime Minister Baldwin of Great Britain recently remarked in the House of Commons, speaking of the occasions "when Parliament has interfered, one way or another, with the conduct of industry," that "whatever the effect of such interference may be or may have been, I am quite clear from what I have seen in the course of the last twelve months that it has done unqualified harm in this respect, and that is as to the feeling that it has generated that, however great the difficulties in the industry, however great the differences between the two sides, it is always possible to get the two sides out of their difficulties and to settle their troubles for them."

time through insistence on long-time contracts. It is very doubtful if they have won lasting concessions from their men. They may have driven below the surface the sullen resentment of the men, and this may flare up whenever conditions in the market change. It is believed that the direct and indirect losses of the British strike are enough to have bought out the whole mining industry of the United Kingdom.

Opened Door to Fuel Oil

The anthracite strike in this country has left scars which will be long in healing. The strike came when fuel oil, as a powerful competitor, was knocking at the door. The strike threw this door wide open. The competitor entered and established himself. It will take more than a rise of price in oil to drive him out again.

The administration apparently is anxious to save business generally from a protracted bilious spell. While all business will suffer from a coal strike, the union operators and the union miners will be hurt more than anyone else if they fail to agree. It is hard to say which would suffer worse from the loss of market to the non-union fields which would follow a suspension. Where both sides have such weighty interests it would seem that each would be willing to approach the subject in a conciliatory spirit as soon as possible.

It is pointed out that the objection to an early conference on the ground that it could not be held until after the miners' international convention in January is a technical one, easily surmounted if there should be any real desire to confer before that time.

Peace No Nearer in British Strike; Miners Continue to Desert Leaders

The opening of the twenty-fifth week of the British coal strike has brought no new elements into the situation. The government continues its "hands off" attitude, taken following the rejection of the Baldwin-Churchill peace proposals by the British Miners' Federation. More men are deserting their national leaders and are returning to work on the owners' terms. Union executives are busy trying to build up the morale of their followers and violence is attending attempts to re-open pits in South Wales.

Delegates to the annual conference of labor organizations at Margate last week heard some plain speaking on the strike situation. Unemployment in other lines, declared J. H. Thomas, general secretary of the railway men's union, made further contributions to the cause of the striking miners impossible. Ben Tillett, spokesman for the dock workers, said 60 per cent of these men were out of work and that they would not support any move for an embargo on coal imports.

District miners' organizations voting on the proposal to withdraw the safety men from the pits adopted the motion referred to the districts by the recent national delegates' conference of the British Miners' Federation by a majority of 175,805 votes. This, however, means little for two reasons: Most of the safety workers are affiliated with another union, which opposes calling out the men; the miners who have returned to work were prohibited from voting on the motion.

Latest estimates on the number of men now at work place the total at 230,000 to 250,000. The higher figure is less than 25 per cent of the number of workers normally employed in the British collieries. The union has suffered its heaviest losses in Nottinghamshire and the relatively unimportant Warwick, Cannock Chase, Shropshire and Staffordshire areas.

The most recent detailed figures on the number of men at work by districts cover the situation at the end of the last month, when 156,162, or less than 15 per cent, of the men had returned. How this number compared with the totals employed in the various districts is shown in the table following:

District	Total Number of Workers*	At Work Sept. 30, 1926
Scotland	139,925	10,559
Northumberland, Durham and Cumberland	246,288	3,963
Yorkshire	191,712	9,471
Nottinghamshire, Derby and Leicestershire	135,863	53,370
Lancashire and North Wales	122,447	8,781
South Wales	245,805	14,942
Warwick	21,756	14,054
Cannock Chase, Shropshire, Staffordshire and Worcestershire	71,471	31,956
Bristol, Forest of Dean, Somerset and Kent	16,717	5,066
	1,191,984	156,162

*Figures on total number normally employed based on British government report for 1924.

Pinchot Assails Lake Rates

Removal of "unjust discrimination will restore Pennsylvania as an active competitor for the lake cargo coal business," said Governor Pinchot of Pennsylvania, in a letter to the Governors of Minnesota, Michigan, Wisconsin, North Dakota and South Dakota relative to the investigation of lake cargo coal rates by the Interstate Commerce Commission, which will begin in Washington, Oct. 25.

Mr. Pinchot's letter, dated Oct. 9, said his attention had been called to a letter written by Governor Gore of West Virginia to the Northwestern Governors on coal rates. The Governor of the Keystone State said that "Governor Gore of West Virginia intimates that it is to the interest of consumers in the Northwest to maintain the present freight rates. In this I believe he is mistaken."

Union Miners Plentiful, Open-Shop Men Scarce, In Pittsburgh District

Competition for mine labor is making itself felt in the greater Pittsburgh mining belt, but particularly in the coke region. There, due to the rush to get mines in operation to share in the demand for export tonnage there is an acute demand for miners, and as most non-union workers are fairly well engaged in all parts of the country, there has been no rush to the coke field.

The independents in the Connellsville district are generally paying the \$5 labor rate, but some of the smaller operators are posting a \$6 figure, with indications that it may go still higher. The H. C. Frick Coke Co. has been paying \$7.50 per day right along.

In the immediate neighborhood of Pittsburgh a number of mines have started up to get some of the available business, but most of those are going in at the Jacksonville scale on the union basis. There is plenty of union labor here, as is evidenced by the fact that at two mines where the union standard was raised upon resumption of operations there were ten times as many applicants for work as there were jobs.

But the open-shop mines in the Pittsburgh territory paying the 1917 rate are finding it impossible to get men at the present time. The union men won't work in the 1917 mines, and the local companies are forced to go further afield for their workers.

More Fact-Finding Hinges On Claire Furnace Case

If the U. S. Supreme Court supports the Federal Trade Commission in the Claire Furnace case, it is the belief of Huston Thompson, former chairman of the Commission, that the Commission will have a clear right of way to conduct an even more sweeping inquiry into the coal business than is contemplated by the Parker bill, which measure, now pending before the House Interstate and Foreign Commerce Committee, provides a fact-finding agency in the Department of Commerce.

If the Supreme Court rules against the Federal Trade Commission, then the jig is up, and neither the Federal Trade Commission nor the Department of Commerce, through the Parker bill or any other legislation, could proceed under the Constitution in fact-finding with respect to the coal industry.

Mr. Thompson expressed this opinion in a statement last week to a representative of the National Coal Association. The former Commission member condemned the Parker measure on the ground that should the Supreme Court sustain the fact-finding principle, which is involved in almost identical measure in the Claire case and the case of the Maynard Coal Co., the latter case having been instituted by the National and now being before the District Court of Appeals, the Federal Trade Commission would proceed to secure the facts and it would be unfair to the coal industry to subject it to the burden of answering the inquiries of a second fact-finding agency in the Commerce Department.



Bootleg Mining Flourishes During British Strike

Ten-manpower hoist in operation at Gwersyllt, in the North Wales coal field. This primitive equipment is used to lower the workmen as well as to raise the coal from the seam, which varies in depth from 12 to 40 ft. below the surface.

Acme Newspictures

Southern Interests Plead Competition, Low-Cost Rail Hauls and Differentials In Defense of Tidewater Adjustment

By Sydney A. Hale

Associate Editor, *Coal Age*

Southern tidewater railroads and spokesmen for the producing interests of southern West Virginia and north-eastern Kentucky came to the defense of the transshipping rates to Hampton Roads in the hearings held the forepart of last week at New York City before Interstate Commerce Commissioner J. B. Campbell and Examiner I. L. Koch in Docket No. 15006, *Rates on Anthracite Coal*. Their answer to the attacks launched by the Northern operators the preceding week against the bituminous freight-rate structure from West Virginia, Kentucky, Pennsylvania and Maryland to the Middle Atlantic and New England states was based upon three major premises:

(1) That the railroads serving Hampton Roads had been built as "coal-handling machines," with low-grade lines, special equipment and service which enabled them to handle coal traffic from southern West Virginia and eastern Kentucky at a much lower cost than that applicable on the transportation of coal from northern West Virginia, Maryland and Pennsylvania to New York, Philadelphia and Baltimore and that, despite low ton-mile yields, the net return on the investment in the Southern lines exceeded that of Eastern Class 1 roads generally.

(2) That the Southern producers were engaged in keen and active competition with the Northern operators in the New England and Middle Atlantic markets. Inland, it was contended, the all-rail rates from the Northern fields gave Pennsylvania and Maryland a decided advantage over southern West Virginia and eastern Kentucky. The advantage lay with the Northern shippers also at ports which could be reached only by light-draft vessels.

Rates Against Hampton Roads

(3) That the differential adjustment, Hampton Roads over Baltimore and Philadelphia, had been against the Virginia piers since the end of the rate war in 1900 and that subsequent changes in rates had increased the differential against the Southern transshippers. A further increase of 25c. in the rates to Hampton Roads, it was testified, would be "disastrous"; an increase of 15c. in these transshipping rates would "hurt" the Southern interests severely. Extension of all-rail rates on Southern coal on the basis of \$1.10 over Clearfield would not materially aid the shippers in marketing coal for industrial purposes in competition with their Northern rivals.

Opening the case for the Southern operators at the morning session of Oct. 11, Robert L. Wallace, New England district manager for the Pocahontas Fuel Co., described the competitive conditions in the Northeast. Formerly, he said, the West Virginia smokeless districts had the edge on the score of dependability, but improved

service by the Northern lines had robbed the West Virginians of some of that advantage in selling New England. The greater friability of the Southern coal demands more extended preparation. Although admitting on cross-examination that there were Pennsylvania producers whose preparation left nothing to be desired, the witness insisted that, in his opinion, West Virginia ranked higher in that respect.

West Virginia shippers moving coal through Hampton Roads, continued the witness, could not penetrate far into New England because of the competition of Pennsylvania coal moving all-rail. The bulk of the West Virginia business was done at or near ports which could accept deliveries from large sea-going barges and boats, principally at points such as Boston, Providence, Fall River, New Bedford, Salem, Portsmouth, Portland, Bath and Bangor. West Virginia, Mr. Wallace testified, has been unable to meet Pennsylvania competition in Vermont and has made only small headway in New Hampshire. A large part of the Connecticut business also is held by the Northern shippers.

Pennsylvania Competition Keen

A canvass of 518 buyers along the New Haven from New Bedford, said the witness, showed 177 who preferred West Virginia coal, 74 who preferred Pennsylvania and 268 who switched back and forth. Out of 177 buyers north of Salem, 50 preferred West Virginia, 80 Pennsylvania and 47 had no preference. In 1924-25, out of 32 Massachusetts institutions buying coal on contract, not one purchased West Virginia fuel; in 1926, however, 21 placed contracts with West Virginia and 11 with Pennsylvania. In some cases the contracts turned on a difference of 1c. in the bids. This data, thought the witness, was proof that competition between the two fields was unusually keen.

Analyzing shipments through Hampton Roads to New England, Mr. Wallace offered an exhibit which showed a movement of 6,971,513 gross tons of low-volatile coal in 1918; 4,346,597 tons in 1919; 4,735,890 tons in 1920; 4,435,386 tons in 1921; 6,966,912 tons in 1922; 6,997,221 tons in 1923; 6,886,623 tons in 1924 and 8,109,548 tons in 1925. Shipments of high-volatile coals through Hampton Roads to New England during the same years were: 846,355 gross tons in 1918; 326,271 tons in 1919; 747,799 tons in 1920; 934,866 tons in 1921; 1,147,734 tons in 1922; 1,599,400 tons in 1923; 1,485,190 tons in 1924 and 1,896,423 tons last year. Railroad-fuel contracts were later given as the explanation of the marked increase in high-volatile tonnage in recent years.

Comparing the movement out of Hampton Roads with the total New

England bituminous receipts, both rail and water, Mr. Wallace, in another exhibit, pointed out that Hampton Roads contributed 5,233,612 net tons out of 18,182,000 net tons in 1919; 6,141,731 out of 22,434,000 tons in 1920; 6,014,682 tons out of 17,188,000 tons in 1921; 9,088,403 out of 18,807,000 in 1922; 9,628,215 out of 23,684,000 in 1923; 9,376,430 out of 18,877,000 in 1924 and 11,206,212 tons out of 21,304,590 tons in 1925.

Any difference in delivery costs, declared Mr. Wallace, must be absorbed by the West Virginia shippers on competitive business. Cross-examined by August Gutheim, counsel for the Northern operators, Mr. Wallace said West Virginia met New York barge competition as far east as Gloucester, but did not meet New York barges frequently east of Cape Cod. The witness told Examiner Koch that a 25c. increase in rates to Hampton Roads would be disastrous.

Little Help from All-Rail

"Assuming lower rates all-rail," continued the examiner, "would it make so much difference if tidewater rates were increased? That is, assume that all-rail rates are extended to points other than those served by the Boston & Maine and New Haven."

"The result still would be disastrous," insisted Mr. Wallace. "It would hit the steam business, which is the big end of the West Virginia trade in New England."

"Would all-rail rates on mine-run change the situation?"

"On the basis of \$1.10 over Clearfield, no," answered the witness.

E. S. Moore, general superintendent of transportation Norfolk & Western Ry., submitted profiles of the line east of Bluefield and explained the favorable operating conditions, including a one-line haul to Lamberts Point, only two cities en route, low grades and none against loaded traffic, heavy car loadings, high engine ratings and equable weather conditions, which made winter loss in locomotive efficiency less than 1.5 per cent, against 5 per cent as normal in territory where the mercury dropped to 40 deg. F. and 25 per cent loss at zero. These conditions were contrasted with two-, three- and four-line hauls on the Northern lines, more congested areas, lower loadings and adverse grades. Mr. Moore stated, in answer to Mr. Gutheim, that his knowledge of the situation on the Northern lines was general rather than specific.

S. M. Adsit, traffic manager, Virginian Ry., testified that his road had been built to handle coal to tidewater and only recently westbound movement had become a tonnage factor. The maximum grade eastbound, he said was 0.6 per cent for a distance of ten miles. The Virginian, like the Norfolk & Western, has long engine divisions, high engine ratings and handles traffic on a large volume basis with relatively low costs. Testimony of the same general tenor with respect to the Chesapeake & Ohio Ry. was given by W. L. Groot, chief of yard and terminal operations.

The history of the rates from Hampton Roads and Baltimore and Philadelphia was put in the record by

A. P. Gilbert freight traffic manager, Chesapeake & Ohio Ry. Prior to 1900, he explained, rebates had made rate stability impossible. This history is summarized in Table I. Mr. Gilbert also offered exhibits covering the relation of bituminous tonnage to all revenue freight and of revenues on the three Southern lines. Bituminous tonnage constitutes from 73.33 to 90 per cent of the tonnage and 61.7 to 78 per cent of the total revenue. Average revenues per ton-mile on all coal range from 5.13 to 5.92 mills; on tidewater coal, from 4.73 to 5.55 mills.

"I am frank to say," remarked Commissioner Campbell, "that these ton-mile earnings look low. It raises the question in my mind as to how much the rates of these prosperous Southern lines should be advanced so as to permit reductions on other rates which may be too high."

George Hawley, vice-president and general manager, C. H. Sprague & Son Co., Boston, Mass., testifying on Oct. 12, described the competitive situation as he saw it in New England. Service out of Hampton Roads, he said, was better than out of Baltimore and vessel rates approximately 5c. less. Large cargoes are handled out of Hampton Roads; the average out of New York is under 2,000 tons. Dumping and trimming charges at the loading ports, he explained usually are absorbed in the vessel rate. All-rail shippers have the advantage of smaller deliveries and less degradation.

In the witness' opinion it was impossible to move high-volatile coal all-rail into New England in any volume at the emergency rates of last winter. Sales of low-volatile prepared, he added, have been very light in the past few months. Rail-and-water transportation of nut-and-slack is difficult, he said, because of the shrinkage, but this mixture is popular with plants having stoker equipment.

J. D. Francis, vice-president, Island Creek Coal Co., who appeared as a witness for the Logan Coal Operators' Association, stated that the sale of high-volatile coal from southern West Virginia in appreciable quantities to New England was a very recent development and only the most favorably situated companies, with low operating costs,

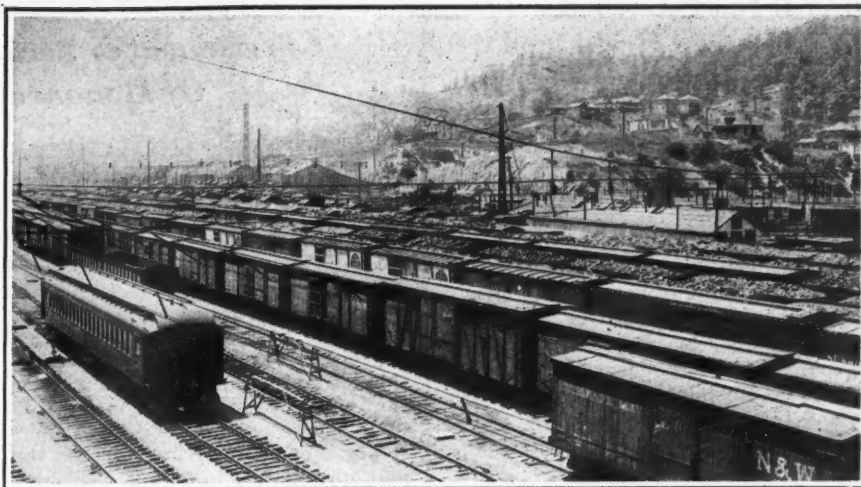


Photo by Ewing Gallows

A Busy Coal-Shipping Center

Railroad yards at Bluefield, on the edge of the southern West Virginia mining field. This is the gateway for tidewater coal over the Norfolk & Western Ry. The yards are electrified.

can compete for this business which absorbs less than 3 per cent of the output of the southern West Virginia and eastern Kentucky high-volatile fields. Fairmont, he pointed out, had recently underbid Logan County on certain railroad business.

H. T. Wilson, president, Red Jacket Consolidated Coal Co., said that the Williamson field had not made much headway in the New England market. As in the Logan field, Williamson coal was given careful preparation. Mine-run shipped to tide was first screened, sized and picked and then returned to mine-run by a cross-conveyor system. Under normal conditions, he said, the rates in effect would not allow the Williamson field to ship to New England. The field produced approximately 10,000,000 tons per annum; its tidewater shipments were 100,823 tons in 1918 and 141,845 tons in 1925. High-record years were 1920 and 1921, when 597,487 and 491,419 tons, respectively, were shipped.

According to W. J. Magee, president, Carbon Fuel Co., Cincinnati, tidewater business is a negative factor in the tonnage of the Kanawha field because of the freight rates against the movement. Kanawha, he declared, cannot

compete with Westmoreland and Fairmont on a price basis in New England. A. R. Yarborough, traffic manager, Kanawha Coal Operators' Association, asked that the Commission remove differentials of 5 to 60c. on eastbound traffic from mines located on the New York Central and short-line connections, putting all the district on the rate basis in effect from Chesapeake & Ohio mines.

Northeastern Kentucky, declared Ben Tate, president, United Collieries, Inc., Cincinnati, was keeping in the tide-water business in the hope that there would be a readjustment of rates. He felt that his district should be accorded the same rate eastbound as the Kanawha group, which paid no differential over the Kentucky mines on westbound traffic.

No tonnage, stated the witness, moved from C. & O. Kentucky groups 4 and 5 to tidewater in 1921, when the rate was 56c. per gross ton over the Kanawha rate. In December of that year this rate was reduced to 20c. over Kanawha and 1,412 cars moved to tide in 1922 and 1,763 cars in 1923. Following a reduction to 10c. over Kanawha, effective Dec. 26, 1923, Kentucky shipments increased to 4,861 cars in 1924 and 9,944 cars in 1925. Largely as a result of the British strike, shipments the first nine months of this year were 15,133 cars.

The Northern interests, in rebuttal testimony, put F. T. Kellers, of the James MacWilliams Blue Line, and Charles O'Neill secretary, Central Pennsylvania Coal Producers' Association, on the stand. Mr. Kellers declared there had been a heavy decline in shipments from New York harbor to Connecticut points since 1920 and that this tonnage had been captured by West Virginia. Mr. O'Neill said that a check of vessels clearing from New York with cargoes for foreign ports during the five months ended Aug. 31, 1926, showed 220 vessels had stopped at Hampton Roads to take on 295,771 tons of bunker coal.

Examiner Koch, in closing the hearing, announced that briefs must be submitted by Dec. 15, following which the examiner will make a tentative report.

Table I—History of Transshipping Rates*

(Rates in Cents per Gross Ton)

	New River-Pocahontas to Hampton Roads	Dumping Charge	Total	Clearfield-Cumberland-Meyersdale-Piedmont to Baltimore	Differential† over Baltimore	Hampton Roads over Baltimore	Differential‡ over Philadelphia
Jan. 18, 1900†....	115	**	115	93	100	22	15
April 2, 1906.....	135	**	135	113	120	22	15
May 1, 1907.....	140	**	140	118	125	22	15
Jan. 20, 1910.....	140	3½	143½	118	125	25½	18½
April 16, 1917.....	150	3½	153½	123	130	30½	23½
Aug. 20, 1917.....	150	4	154	123	130	31	24
June 25, 1918.....	200	4	204	173	180	31	24
Sept. 1, 1919.....	200	5	205	173	180	32	25
Aug. 26, 1920.....	280	5	285	253	260	32	25
July 1, 1922.....	252	5	257	225	232	32	25
Oct. 1, 1926.....	252	5	257	225	232	32	25

* The rates shown are based on an exhibit filed in Docket No. 15006 before the Interstate Commerce Commission by A. P. Gilbert, traffic manager, Chesapeake & Ohio Ry.

† The rates shown were adopted as a result of a conference of the executive committee of the Tidewater Bituminous Steam Coal Traffic Association, Jan. 18, 1900. This same conference also fixed rates of \$1.15 from the Cumberland region to Philadelphia and \$1.08 to Baltimore; a common rate from Cumberland, Meyersdale and Piedmont became effective between that time and April, 1906. The railroad executives in their meeting also set rates of \$1.30 from Clearfield and Meyersdale to New York and \$1.45 from the Cumberland district.

** Dumping charges included in the rate to the port.

‡ This charge was not applicable via the Virginian, which first published rates to Sewalls Point (Hampton Roads) on March 15, 1909, until April 15, 1912.

† Including dumping charge in Hampton Roads rate; this dumping charge, it was testified at the New York hearings by other witnesses, is absorbed by the vessels performing the coastwise transportation. Northern interests, therefore, contend that the differentials should be figured on the flat transshipping rate. Adoption of that basis, of course, would reduce the differentials shown for dates subsequent to Jan. 19, 1910 by 3, 3½, 4 and 5c. per gross ton.

National Safety Council Will Discuss Health and Safety in Mine Industry

For its Fifteenth Annual Congress the National Safety Council will go to Detroit. The annual general meeting of members starts on Monday morning, Oct. 25, at the Book-Cadillac Hotel. At this meeting the election of directors will take place. Two addresses are scheduled for the general meeting, one, "The Dramatic Aspects of Our National Accident Toll," by Rev. Alfred W. Wishart, Grand Rapids, Mich.; the other, "The Hospital's Part in Prevention and Cure of Disabilities," by Rev. C. B. Moulinier, Milwaukee, Wis., representative of the American Conference on Hospital Service.

The first session of the Mining Section will be held at the Fuller Hotel starting at 9:30 a.m. Oct. 26. Jas. L. Davidson, secretary, Alabama Mining Institute, will lead off with a discussion of "Safe Practices in the Coal Mines of Alabama." The next paper, by C. S. Hurter, of E. I. duPont de Nemours & Co., will treat of "Safe Blasting Methods in the Lake Superior District Mines, Underground and Open-Pit"; A. J. M. Ross, general mine foreman, Homestake Mining Co., Lead, S. D., will describe "Methods of Promoting Safety Interest in the Homestake Mine."

Will Tell Value of Rock-Dusting

At the second day's session H. C. Henrie, Phelps Dodge Corporation, Bismarck, Ariz., will describe the "Employees' Representation Plan and Its Connection with Safety and Personnel Relations." J. S. Jones, safety engineer, Old Ben Coal Corporation, West Frankfort, Ill., will speak of the "Value of Rock-Dusting in the Prevention of Coal-Mine Explosions." "Safeguarding Electrical Equipment in Mines," by Daniel Harrington, will follow. Mr. Harrington is chief engineer of the Safety Service, U. S. Bureau of Mines, Washington, D. C.

Beginning the third session on Thursday morning, Clyde McDowell, manager, industrial relations department, Davis Coal & Coke Co., will talk on "General Safety in and About the Mines." J. J. Forbes, U. S. Bureau of Mines, Pittsburgh, Pa., will illustrate by lantern slides his lecture, "Mine Safety Devices." In all the foregoing sessions time for discussion will be provided for each of the subjects mentioned and a round table on Mine Safety Stunts will conclude the sessions of the mining section.

"Fire Fighting with Snow (Fire Protection Through the Use of CO₂ Gas with Demonstration of 'Liquid Snow')," a subject of interest to mining men, will be handled by P. W. Eberhardt, of Walter Kidde & Co., New York City. His paper is scheduled for Wednesday morning at the meeting of the Public Utilities Section, which also will be held in the Fuller Hotel.

In the Crystal Ballroom and Italian Gardens of the Book-Cadillac Hotel a safety exhibit will be held. The annual banquet will be held Oct. 27 at 6:15 p.m. in the same hotel.

Government to Back Standardization Plan Of Monongahela Operators

Standardization both as to size and quality, with the backing of a government guarantee, is to be put into effect at an early date by operators along the Monongahela R.R. in northern West Virginia, representing an annual output of 12,000,000 tons. The program got a flying start last week at a conference between Herbert Hoover, Secretary of Commerce, and a delegation from the newly organized Monongahela Coal Operators' Association. Secretary Hoover heartily indorsed the plan and agreed to lend the services of an expert from the U. S. Bureau of Mines to assist in working out the program, which will mean a reduction in the number of sizes from about a dozen to four or five and the adoption of standard cleaning equipment.

When the plan is in operation it is thought that it will be possible to market Monongahela coal on an average heat value, based on British thermal units, with provision for maximum sulphur and moisture contents and a minimum fusing point. The association will then launch a trade-mark advertising campaign for its fuel.

In return for the government's

co-operation and guarantee the individual operators will give written assurance to the Commerce Department that they will adhere to the standards which are to be agreed upon at conferences to be held later. The association will name a committee to carry on the negotiations with Secretary Hoover in developing the plan. Delbert H. Pape, executive secretary of the association, will act with this committee.

Judge W. S. Bennett, of Chicago, associate counsel of the association, acted as chairman of the delegation that conferred with Secretary Hoover, the other members of which were John H. Jones, president of the association and president of the Bertha-Consumers Co., Pittsburgh, Pa.; Edward Hines, Chicago, head of the Hines coal and lumber interests; H. W. Showalter, president of the Continental Coal Co., Fairmont, W. Va.; Joseph Pursglove, head of the Pursglove coal interests, Cleveland, Ohio; Whitney Warner, of the Warner Collieries Co., Cleveland; W. E. Watson, president of the Fairmont & Cleveland Coal Co., Fairmont, W. Va., and John S. Phillips, president of the Delmar Coal Co., Fairmont.

Urges Coal Storage to Avert Shortage and High Prices

Urging the public to regularize their coal buying and to resort to storage, L. W. Wallace, executive secretary of the American Engineering Council, declares in a statement that a severe winter would cause a coal shortage and high prices. A nationwide survey by a committee of the Council headed by W. L. Abbott, of Chicago, president of the American Society of Mechanical Engineers, showed, Mr. Wallace asserts, that famine conditions could be eliminated if consumers seasonably stored coal.

"From all reports," Mr. Wallace says, "the stocks of coal went to a low ebb during the summer. Probably there was less coal in storage at the beginning of this month than at any time in recent years. Now activity is evident in several centers. Users of coal are beginning to purchase. Car shortages are already appearing. There is heavy buying and pressure for shipments. There is no excess of coal at New York piers and there is a large movement of coal abroad.

"The Coal Storage Committee of the American Engineering Council, after an exhaustive investigation in which more than 400 engineers in leading industrial centers took part, has recommended and urged that all coal consumers purchase their coal on an annual contract for yearly requirements with a provision that the coal be delivered monthly in equal allotments.

"The committee further recommended and urged that consumers provide

necessary storage facilities to meet the terms of such contract. These recommendations are based upon the finding that the purchase of coal upon a uniform monthly delivery basis will result in a condition whereby:

"Coal mines may inaugurate and maintain a regular production schedule.

"Carriers may plan definitely as regards both schedules and equipment for a uniform movement of coal.

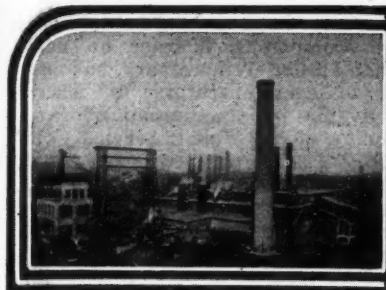
"Stocks of coal automatically will accumulate during the months from April to September inclusive in sufficient amount to meet the extra consumption during the winter months.

"A reduction in the price of coal will be made possible by more regular schedules of production and transportation and by elimination of peak demands in the winter months, when the costs of both production and transportation are the highest."

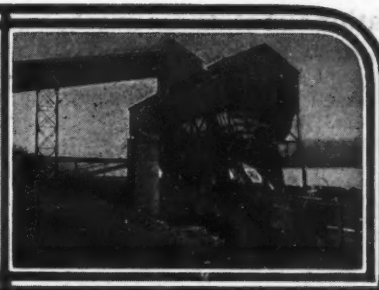
Mines Long Idle Resume At Union Scale

The Gibson mine of the Hillman Coal & Coke Co., at Bentleyville, Pa., reopened Oct. 18 with union wages after a shutdown of eighteen months. About 300 miners will be employed. This is the third mine to open lately in the Pigeon Creek district under the union scale.

After two years of idleness the Fort Pitt mine of the Central Coal Mining Co., on the Ohio River near St. Clairsville, Ohio, also resumed operations on Monday, employing over 200 men. The mine began operations on a union basis.



News Items From Field and Trade



ALABAMA

Awards Contract for Shaft.—Contract for sinking the new shaft of the Tennessee Coal, Iron & Railroad Co. in the Pratt division, near Pratt City, has been awarded. This shaft will penetrate the workings of the Hamilton slope, and when completed all coal from the operation will be hoisted through this opening.

Coke Plant to Expand.—The Alabama By-Product Corporation will award a contract soon, it is reported, for the addition of 49 Koppers ovens to its plant at Tarrant City. Representatives of the Koppers Company have been in the district recently in connection with the proposed work. The present plant, which consists of 100 ovens of the Koppers type, has been in continuous operation since its construction. All coking plants in the Birmingham district are working at capacity production.

At the annual meeting of the Alabama Mining Institute held Oct. 6 vacancies on the board of governors due to the expiration of the terms of members were filled by the election of Frank H. Crookard, president of the Woodward Iron Co.; Charles F. DeBardeleben, president of the Alabama Fuel & Iron Co., and A. B. Aldridge, general manager of the Stith Coal Co.

Institute Re-elects Officers.—The board of governors of the Alabama Mining Institute held a meeting Oct. 12 to name officers of the association for the next year, the election resulting in the continuation of all the old officers for another term. They are Frank Nelson, Jr., president; C. A. Moffatt, vice-president; James L. Davidson, secretary; H. E. Mills, assistant secretary and statistician. Mr. Davidson has served in the capacity of secretary for about fifteen years and Mr. Mills also has been connected with the association for a long period.

In the Sept. 30 issue of *Coal Age* it was stated that the Davis Creek & Coke Co., of Birmingham, was building a \$400,000 coal washer near Yolande. J. B. McClary, president of the company, requests that a correction of this statement be made. The washer, he says, will have a capacity of 400 tons per day.

ILLINOIS

Halts Annexation Move.—U. S. District Judge Louis Fitzhenry at Springfield, on Oct. 12 handed down a decision which prevented the citizens of Nameoki, from voting Oct. 14 on a proposition to annex several hundred acres of land adjoining the city limits.

The ground sought by the city includes the property of the St. Louis Coke & Iron Co., which brought the action to stop the election. Judge Fitzhenry issued a temporary restraining order and will hold a hearing later before determining whether to make the injunction permanent. Counsel for the company contends that the village merely wishes to collect taxes on its property and that it will not benefit from being annexed. Nameoki now has 400 inhabitants, while the territory it seeks has about 600 residents.

For the twelve months ended July 31 the United Electric Coal Companies reports a net income of \$545,781, after depreciation, depletion, interest, federal taxes, etc., as compared with \$517,978 for the previous twelve months. Profit from operations totaled \$1,102,988, while other income was \$33,000. Charges aggregated \$590,207.

Mine No. 7 of the Consolidated Coal Co., Herrin, has resumed operations.

INDIANA

Pike County Perks Up.—The Globe Coal Co. has put in operation its new \$60,000 tippie on the site of the old tippie which was destroyed by fire last July, and has bought additional land adjoining the property along Sugar Ridge, in Pike County. It will be three or four years before the new holdings can be worked out. The Gladstone mine, idle all summer, has resumed operations, working five days a week.

William P. McQuade has resigned as receiver for the Green Mound Coal Co. in Daviess County. McQuade gave as his reason for resigning that he was leaving to take a position in the West. Judge Edgar Durre of the Vanderburg County Superior Court has appointed W. C. Welborn of Evansville as receiver to take his place. A dispute over this company's mine brought Tyler G. Lawton, president of District No. 11, United Mine Workers, before Judge Durre for contempt of court several months ago. Lawton was found guilty by Judge Durre, who sentenced him to sixty days in jail. Lawton appealed to the Supreme Court of Indiana and the upper court as yet has returned no decision in the case.

In and around Boonville, Warrick County, the Sunlight Coal Co. and other coal companies are taking over much farm land. The farm of Ed Owen, consisting of 60 acres, was purchased by the Sunlight company for \$7,500 and the Pelzer farm of 250 acres also was purchased by the same company for \$32,000. The Sunlight company operates one of the largest strip mines in

southern Indiana. Thomas Mullins, former Mayor of Boonville, is manager of the company.

KENTUCKY

Backwoods Company Sold.—J. M. Day, Whitesburg banker and capitalist, with others, has just taken over the mines of the Backwoods Coal Co. in Hazard, Perry County, and will start operations soon. The consideration was said to have been approximately \$25,000. The mines have been in successful operation for several years.

Cannel Coal Development Planned. The Kings Creek Coal Co. is the name of a new coal mining corporation which has just been organized at Roxana, ten miles below Whitesburg, for development of a large cannel coal tract on the Kings Creek headwaters just out from Roxana. The mine will be served by an eight-mile branch of the Louisville & Nashville Ry. nearing completion. This company, of which L. Wilson Fields, of Whitesburg, is at the head, purposes a capacity of twenty cars daily and announces that mining work is to be started within the next thirty days. Several hundred men are being employed now in building and construction work. The Champion Coal Co., an Eastern corporation, also is preparing to begin extensive development of large deposits of cannel coal in the same section.

Form New Company at Colliers.—The North Fork Coal Mining Co. has just been organized at Colliers, several miles below Whitesburg, on the main line of the Louisville & Nashville Ry., by C. A. Walters and Matthew Woodall, of Blackley. Mining will be started as soon as possible, the old mines at Colliers having been taken over. These will be overhauled and improved and new machinery is to be installed. The capacity of the mines will be built up to eighty cars daily.

OHIO

Eastern Ohio Mines Active.—William T. Roberts, secretary-treasurer of the fifth subdistrict, United Mine Workers, reports that approximately 12,000 miners of that field are back at work. Three mines were reported last week as cleaning up preparing to resume operation. The Pultney mine, at Bel-laire, idle for nearly three years, may resume shortly, company officials said. The Budd mine of the Youghioghenny & Ohio Coal Co., at Glen Robbins, resumed Oct. 14 after a long idleness. The mine, which employs 400 men, has worked only two days this year. The Youghioghenny & Ohio company, which

is one of the largest in Ohio, has all of its eastern Ohio mines in operation now. More than a dozen mines have resumed in full or part during the last several weeks.

Hocking Valley Mines Reopen.—Additional mines are being opened in the Hocking Valley mining field. The Lost Run mine of the Essex Coal Co., at New Straitsville, was started Oct. 11 and a number of smaller operations in the Nelsonville field are going at full blast. The output is larger and miners have no difficulty in finding employment.

To Scrap Municipal Yard.—The Columbus Municipal coal yard, established by the City Council in 1918 to provide the public with cheap fuel, will soon be a thing of the past as the Council has provided for razing of the plant and the sale of the equipment, which originally cost about \$20,000. The public was led to believe that it could buy good coal cheap, but the purchasing department could not carry out that idea and it never was popular. The loss from operation mounted into tens of thousands of dollars. During the past few years it has been operated as a distributing station for coal for the smaller city departments such as fire engine houses, street cleaning department and asphalt plant where coal is bought in less than car-load lots.

Judge A. M. J. Cockran at a hearing in the U. S. Court for Eastern Kentucky granted a permanent injunction on Oct. 12 against the Carr's Fork Coal Co., Hiram O. Owens and H. E. Bullock restraining them from disposing of any stock in the Jewel Coal Co. of Hazard or the Avondale Development Co. of Cincinnati until a final adjustment is made of affairs in connection with the liquidation of the Wallins Creek Coal Co. and other matters now pending before the courts are adjusted. The hearing was held in Lexington, Ky.

PENNSYLVANIA

Bertha Mines on Full Time.—The Bertha Consumers Co. during the last week increased its operations at the Bertha mine from part time to full time, and also started up in full blast at the Jean mine, which until recently had been idle for several months. Both these mines operate on the Jacksonville scale. The mines are located in the Panhandle section, and 200 more men are engaged.

The U. S. Engineers of the Pittsburgh district report coal movement on the rivers in this locality during September as follows: Monongahela River, 1,883,078 tons of coal and 92,189 tons of coke; Ohio River, 521,685 tons of coal and 54,000 tons of coke; Allegheny River, 124,445 tons of coal.

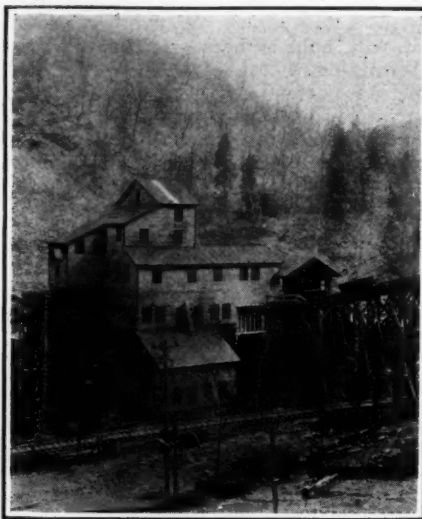
Frick Plants More Active.—The H. C. Frick Coke Co. is cleaning up the Dorothy plant, preparatory to resuming operations. This plant is located near Latrobe. The same company's coal and coke plant at Whitney, near Latrobe, also has received orders to start up.

Steady Work for St. Vincent Mine.—The St. Vincent mine of the Mount Pleasant Coal & Coke Co., near Latrobe,

has started operations. Officials of the company are quoted as saying a large order will enable it to operate steadily.

The Lowber Gas Coal Co. has started operations on the Jacksonville scale at its mine at Fayette City.

Workers Plentiful.—The Carnegie Coal Co. has started operations at two of its mines in the Panhandle district, the McDonald and Louise mines, both paying the Jacksonville scale. It is reported there are 200 men at work in each mine. At these two mines it was declared that the applications for work were ten times the number of men required.



Tipple and Washer at Bosworth, Ky.

This plant, in the Middlesboro section of the Southern Appalachian field and belonging to the Yellow Creek Coal Co., is located on the Kentucky-Tennessee line. The mine has an allotment of 800 tons per day. The washer is not used, presumably because the impurities are found in the sizes which can be picked, and not in the slack.

The Ontario Gas Coal Co. has started up its Ontario mine, three miles from Ellsworth, on the Jacksonville scale. Three hundred men went to work, but 2,000 applied for jobs. The mine had been idle eighteen months.

The Glassmere mine of the Crucible Fuel Co., near New Kensington, idle for eighteen months, has resumed operations on the Jacksonville scale. This mine uses 250 men and produces 1,000 tons a day.

The Midway mine of the Midway Coal Co., near Carnegie, has resumed operations on the Jacksonville scale. It was idle since March 30, 1926.

Versailles Mine on 1917 Scale.—The McKeesport Coal & Coke Co. is operating its mine at Versailles on the 1917 wage scale. This is the only mine in the Pittsburgh district that works the Freeport bed of coal.

May Work at 1917 Scale.—Two companies are planning to start operations on the 1917 scale in the Pittsburgh district. The McClane Mining Co. is reported considering opening the Jean mine of the company, near Imperial, and the Eclipse Gas Coal Co. is said to be contemplating opening its mine near Finleyville.

Urge Quick Loading and Unloading.—A warning that a serious shortage in

freight cars impends unless shippers unload promptly and order no more cars than absolutely necessary, has been issued to coal operators in central Pennsylvania by the bureau of rates and tariffs of the Public Service Commission. The threatened shortage is particularly serious in open-top equipment due to the heavy shipments of coal, sand, gravel and similar products.

The Rich Hill mine, at Hastings, one of the largest in central Pennsylvania, has resumed operations after a shutdown of several months.

Sale of the Meyersdale Electric Light, Heat & Power Co. and the Pennsylvania & Maryland Railway Co. to the Associated Gas & Electric Co. of New York City, was announced Oct. 8. Mrs. Jennie Wilmoth, owner of the Somerset County enterprises, will retain her interest in the Berkey Coal Co.

The Reading Co. transported 1,636,365 gross tons of bituminous coal (revenue) during August, 1926, compared with 1,724,894 tons in the corresponding month a year ago.

The Hudson Coal Co. recently presented a request to Councilmen of Wilkes-Barre for permission to cave in two city streets so that pillars could be removed and coal left in the mines when first mining was completed years ago might be recovered. The Hudson Coal Co. owns all of the property which lies along these streets and has agreed to restore the two streets to their present condition after the mining operations have been finished and the filled-in ground has settled. The property to be caved in is on the extreme northerly end of the City of Wilkes-Barre.

Open-Shop Output Shattered.—Coal output at the twelve open-shop mines of the Pittsburgh coal Co. in the Pittsburgh district broke all records during the week ended Oct. 9, when 73,896 tons was produced. The best previous week's tonnage was obtained in August with a total of 73,332 tons. An average of 3,119 men were at work when this month's record was made. The output by mines was as follows: Warden, 11,485 tons; Banning No. 1, 5,965 tons; Banning No. 2, 9,269 tons; Midland, 9,732 tons; Montour No. 10, 9,387 tons; Mansfield, 1,685 tons; Dickson, 4,441 tons; Euclid, 4,279 tons; Ocean No. 5, 5,101 tons; Montour No. 9, 3,900 tons; Somers No. 4, 5,424 tons, and Moon Run, 3,228 tons.

To Open on Jacksonville Scale.—The Keystone Mining Co., of Rimersburg, is preparing to resume operations this month at its mines, which have been shut down since May 1. The Keystone company owns three mines in that neighborhood, one at Sarah Furnace and two on the Sligo branch near Rimersburg. When running full it employs 400 men and has a daily output of 1,500 tons. The company will pay the Jacksonville scale.

VIRGINIA

The Virginia Jellico Coal Co., Inc., has been authorized by the Virginia State Corporation Commission to sell \$175,000 worth of common stock in Virginia.

WEST VIRGINIA

New Opening at Blazer.—Announcement has been made by the Snider Coal Co., of Grafton, that it has driven a new opening to the Bakerstown seam at Blazer, three miles east of Tunnelton, and that operations will be started immediately. John Snider, of Grafton, is manager of the company. After one and one half miles of track has been laid from the railroad to the mine and a tipple has been built, loading of the product for shipment will begin. At the outset about twenty men will be employed, but additional men will be added as their services are needed. The seam to be mined is about 4 ft. thick and is said to be a high carbon coal.

The Pine Bluff Coal Co. has leased its holdings and equipment to the Willow Coal Co., of Clarksburg, of which Lynn S. Hornor is president. The Pine Bluff properties are in the clay district of Harrison County. The lease is to run until all the coal is mined. The property leased consists of mining equipment, tracks and tramways to-

tipple, which was burned to the ground. Mine No. 1 of the Corona company, situated near No. 2, is producing coal.

Lambie on Safety Drive.—Giving his personal attention to the campaign to reduce the number of accidents in the mines of West Virginia, Robert M. Lambie, head of the state Department of Mines, held meetings late in September and early in October in the New River field instructing both officials and workmen in safety-first methods. As a result of his visit to various mines more than usual precautions for safety are being taken.

State Has 1,208 Commercial Mines.—The Department of Mines reports that 1,208 coal mines, excluding between 200 and 300 mines employing from three to five men, are now in operation in West Virginia. There has been a steady decrease in the number, through consolidations and concentration of operations at fewer mines. There has been a marked increase in output as a result of the greater concentration. The Consolidation, for example, closed several

cent; fixed carbon, 57.4 per cent; calorific value, 10,300 B.t.u. Quantities of coal also have been found a mile downstream from the exposure examined.

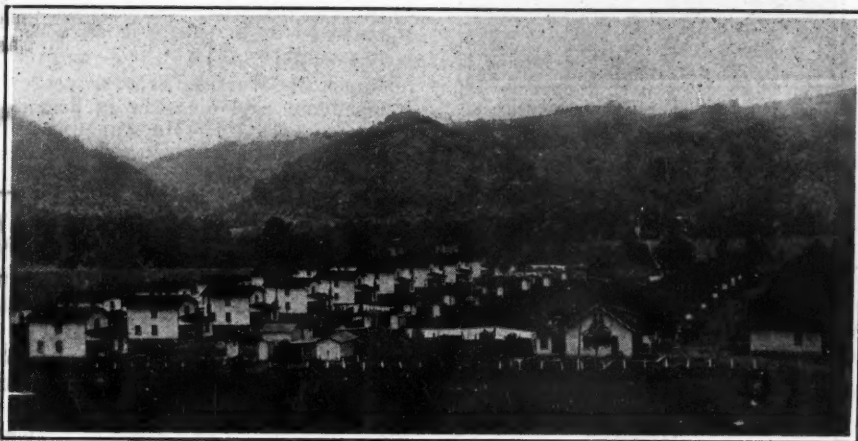
Abandon Trial Shipments.—Arrangement for the shipment of 6,000 tons of Alberta coal to Ontario in order to determine haulage costs has been abandoned owing to the change of government at Ottawa. The new administration refused to continue the \$7 per ton freight rate previously granted, so the project was abandoned after 2,000 tons had been delivered.

An additional 1,000 ft. of space for the unloading and storage of coal on the harbor front at Montreal will be provided before Aug. 1, 1927, it is reported from the Harbor Commission offices. Of this amount 500 ft. will be ready at the opening of navigation next year and the balance by August. This pace will be provided east of the present storage space, which extends from section 29, east of Delorimier Ave.

Sell Bogus Mixture.—Complaints have been received by coal wholesalers in Montreal that Pennsylvania soft coal and semi-anthracite are being mixed with British fuel and sold as standard Welsh and Scotch anthracite. As a result, the Montreal Coal Association, Inc., has issued a statement warning the public "against the actions of unscrupulous coal merchants in endeavoring to substitute coals of unknown values for the regular Welsh and Scotch products." The coals that are being imported for mixing, it is said, can be purchased more cheaply than the standard American anthracite.

Bearish on Northern Coal Areas.—A geological party headed by Professor Montgomery, of Toronto University, sent out by the Ontario Government to explore the country on the St. James Bay slope, where valuable coal deposits were said to exist has returned to Toronto. Their report, which is in the hands of the government, is stated to be adverse to the value of the field. This is in opposition to the opinion of Prof. W. T. Russel, of London, Ont., who in recent reports has consistently declared that valuable coal deposits exist in the north country. Officials of the provincial Department of Mines state that the government so far has taken no stand upon the value of any showings of coal that may have been located there. The only action taken by the government has been to set aside a tract of land near the Missinabe and Abitibi rivers for the development of government policy in the event of the coal finds proving of value.

D. H. McDougall, vice-president of the British Empire Steel Corporation, Sydney, N. S., recently returned from the coal fields of Alberta, reports that there are millions of tons of high-grade bituminous coal in the Peace River district of quality superior to the highest grade of American coal. Mr. McDougall said he did not think the development of these coal fields would affect the coal industry of eastern Canada as Alberta coal would always find a ready market along the Pacific Coast of the United States. He described the Peace River deposits as being the greatest in Canada.



Mine Village of Franko Unusually Attractive

The homes of the miners who work at Frances No. 1 mine of the Consolidated Fuel Co., which is closely affiliated with the Bertha Consumers Co. The clean, bright, cheerful look melds well with the landscape. This mine is in Marshall County, West Virginia, that county being located at the point where the Panhandle is welded onto the rest of the state.

gether with about 115 acres of a 9-ft. seam of Pittsburgh coal. The lessee is to pay 15c. a ton royalty for the coal mined the first year, the minimum amount of which is not to be less than 40,000 tons, and 18c. a ton after that, with the yearly minimum not less than 60,000 tons. The lease was signed for the Pine Bluff company by its president, Clyde A. Hill.

Early development of the vast coal and timber resources of the Big Clear Creek section of Greenbrier County is foreshadowed by activity toward extending a railroad line from Rupert. Right of way has been cleared off for about seven miles up the creek and two steam shovels are at work grading. The Raine and Leckie interests have large holdings in addition to the Gauley company.

Corona Fire Out.—Fire in No. 2 mine of the Corona Coal Co., at Hepzibah, which has been burning for almost two months, has finally been extinguished, states B. R. Britt, part owner and manager of the mine. He also said that it will be possible to resume operations within a few weeks. It will be necessary to rebuild the wood and steel

mines, but its force of miners has been increased. Instances are not lacking where coal companies have cut through from one mine to another and have combined the production of two mines into one mine.

CANADA

Alberta Coal in New Market.—A market for hard coal from western Alberta is being opened in Vancouver, where this grade has been found suitable for bunker and steamship use. Some small experimental shipments have been followed by an order for 6,000 tons to be shipped at once. Results so far having been encouraging.

Dr. L. J. Weeks, of the Geological Survey of Canada who is making an investigation of Baffin Island, in the Arctic Circle reports the occurrence of coal which is well exposed in a cliff on the Salmon River. Two main seams, each 3½ ft. thick and 18 ft. apart were found. It is the coal from the lower seam that is being utilized by the Hudson Bay Co. An air dried sample gave, on analysis, moisture, 14.2 per cent; ash, 5 per cent; volatile, 23.2 per

Among the Coal Men

George P. Gallagher, of West Pittston, Pa., who is well known in the anthracite field has been appointed general mining superintendent in charge of all active operations of the Lehigh Valley Coal Co. This is a newly created position. Karl F. Arbogast, of Kingston, Pa., has been promoted to succeed Mr. Gallagher as superintendent of the Luzerne division.

George E. Akerson, Washington correspondent of the *Minneapolis Tribune*, has been named as an assistant to Herbert Hoover, Secretary of Commerce. He succeeds Harold Phelps Stokes. Mr. Akerson was born in Minneapolis. He was graduated from Harvard University in 1912 and since that time has been with the *Minneapolis Tribune* in various capacities, including that of assistant managing editor. He first came to Washington as a correspondent in 1921. Besides his newspaper work, for the last year Mr. Akerson has served as secretary of the National Sesqui-Centennial Exhibition Commission, which is composed of the Secretary of State and the Secretary of Commerce.

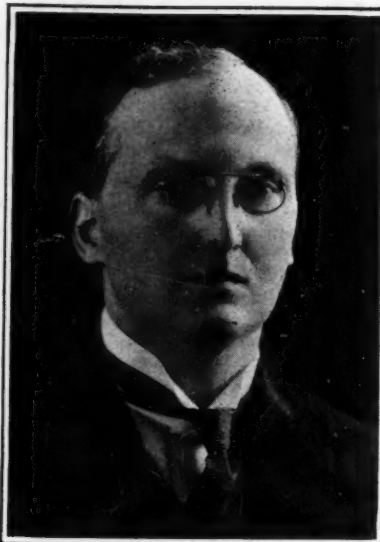
Bob Hager, who for ten years was a bright and shining light in Cincinnati's wholesale coal trade until the Florida land bug stung him last fall, is back with his first love. He is acting as a special representative of the Carr's Fork Coal Co. at Portsmouth, Ohio, where a large number of the stockholders reside.

B. Lee Hutchinson and Gohen Arnold, two of the outstanding figures in the consolidation of various mines and properties that were welded into the West Virginia Coal & Coke Co. about two years ago, returned recently to Cincinnati and on their heels came rumors that a new producing and marketing company was in the course of formation.

A. C. Cook, who has been with the Wilson organization for the past thirteen years, has succeeded Dave Cave as the manager of the sales department of the Norfolk & Chesapeake Coal Co. at Cincinnati. Mr. Cook, besides having traveled Ohio and Michigan extensively in a sales way, has had three years experience at the Red Jacket mines in Logan County, West Virginia.

C. E. Kenworthy has been appointed manager of the Norfolk (Va.) office of Furness-Withy & Co., Ltd., one of the largest shipping agencies at that port. He succeeds C. H. Freeman, who resigned to engage in other business. Mr. Kenworthy's promotion is the result of several years of valuable work with the company.

Alfred Eickhoff, proprietor of Eickhoff Bros., Bochum, Germany, arrived on the steamer "Resolute," Oct. 14, with Dr. Fritz Kleffner, one of his staff, to make a visit of inspection of American coal mines and mining machinery, proceeding as far as Salt Lake City and possibly the Coast.



H. F. Coward

Having concluded his term of work with the U. S. Bureau of Mines, H. F. Coward is returning to Great-Britain. His services were lent by the British Government in return for those of Reinhardt Thiessen. Mr. Coward has been experimenting in the propagation of the flame of methane and, with G. W. Jones, has prepared a report on the "Extinction of Methane Flame by Helium."

Obituary

Ernest Echols, formerly superintendent of the mine at Echols, W. Va. died suddenly last week at his home in Glasgow, Va. As he had not been ill the news of his demise was a distinct shock to friends in the section where he was well known. Mr. Echols was a brother-in-law of B. E. Carter, of Beckley, and the latter left for Glasgow immediately after receiving word of Mr. Echols' death. Mr. Echols leaves a wife and family.

Death recently claimed William Moffat, Dunmore, Pa., owner of the Moffat Coal Co., of Minooka. Mr. Moffat was struck by an automobile while near his cottage in Atlantic City a few weeks ago and he never recovered from the injuries. He was 63 years of age.

Burdette B. Ireland, 44 years old, formerly connected with the Swift Run Coal Co., of Columbus, Ohio, who sold out his interest in 1925, committed suicide recently by hanging himself in the Ireland grain elevator at Beattytown, a few miles south of Springfield, Ohio. Ill health was said to be the cause for taking his life. He was prominent in civic affairs when he resided in Columbus. He leaves a wife and three children.

Frank J. Urbain, prominent southern Illinois coal operator, died Oct. 10. Mr. Urbain, who was 70 years old, was

well known in coal mining circles in St. Louis, Mo., and the southern Illinois mining field. In 1900 he helped to sink the first coal-mine shaft in Franklin County, Illinois, now the greatest coal-producing county in the state.

Frank Koehne, aged 78 years, formerly an operator in the Middle West, died Oct. 8 at Mt. Carmel Hospital, Columbus, Ohio, where he went to undergo an operation. Mr. Koehne had been traveling for the western office of the Elk River Coal & Lumber Co. for the past few years but was previously with A. Brenholtz, the W. J. Hamilton Coal Co., and other operators and jobbers. He was formerly a miner, later a mine owner and operator in Kentucky, at one time secretary of the Ohio Penitentiary and was prominent in civic affairs. He resided in Columbus, where he leaves his widow and several daughters.

Oscar Schlatter, 45 years old, Brazil, Ind., head of the Schlatter Brothers Co., coal operators, died recently at a hospital in that city from burns inflicted by an electric wire in his garage. He is survived by a wife, a small son and a stepdaughter.

James M. Murray, Sr., for years an independent coal operator in Scranton, Pa., died recently. He was owner of the Murray Coal Co., which produced coal from a working on the East Mountain.

Trade Literature

U. S. Maps and Charts. W. & L. E. Gurley, Troy, N. Y. Bulletin M-502. Pp. 20; 3½x6½ in.; illustrated. Explains the organization and activities of the Board of Surveys and Maps of the Federal Government and tells how the maps and charts of the government are made and where obtainable.

Self-Cleaning Grates—Tools. Steere Engineering Co., Detroit, Mich. Pamphlet No. 292. Four-page folder illustrating and describing self-cleaning grates and tools manufactured by this company.

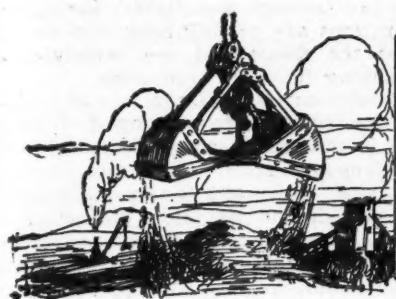
Lo-Hed Hoists. American Engineering Co., Philadelphia, Pa. Pp. 42; 8x11 in.; illustrated. Describes six new hoists manufactured by this company; their operation in minimum headroom is emphasized.

Hyatt Roller Bearing Co., Newark, N. J., recently issued Bulletin 1560, containing data of interest to engineers and draftsmen concerned with the designing or development of plant and production equipment.

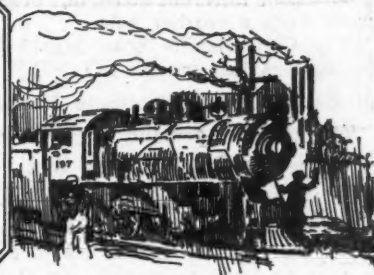
American Pulverizer Co., St. Louis, Mo., recently issued the following four-page folders: American Ring Coal Crushers, American Ring Pulverizer and No. 13 American Ring Pulverizer. These describe and illustrate the different installations and give specifications.

Carbon Products. The United States Graphite Co., Saginaw, Mich. Catalog B-4. Pp. 39; 5½x9 in.; illustrated.

The De Laval Steam Turbine Co., Trenton, N. J. has issued a four-page folder illustrating and describing the water works pumping station of Jackson, Mich.



Production And the Market



Eastern Bituminous Coals Enjoy Heavy Demand; Spot Prices Highest Since 1923

The line of demarcation in bituminous coal activity again has become sharply defined. Throughout the great Appalachian Region, with the exception of Alabama and parts of Tennessee, demand is swelling and prices on spot deliveries are advancing so rapidly that weighted average figures have touched the highest point reached since September, 1923. West of that great coal-producing belt, however, business still awaits the touch of zero to give it the accepted superficial aspects of liveliness.

As has been the case since mid-July, overseas movement brought about by the British strike is primarily responsible for the marked improvement in Eastern coals. Lake business, which has been the largest since 1923, also has played an important part; indeed, without it the export movement would not have been able to lift the industry out of the rut of the humdrum. Together they have taken the pressure of West Virginia and eastern Kentucky out of competitive inland all-rail markets and permitted increases in production where they were little anticipated.

Will Middle West Benefit?

One of the notable results of this movement has been an increase in output in southern Ohio from 18 to 20 per cent of capacity to 65 to 70 per cent. Central Pennsylvania also has been mining more coal. Some benefit already has come to the Illinois and Indiana fields in the way of increased home demand, due to the higher prices asked for spot Eastern grades and the reduction in the free tonnage. Productive capacity in the Middle West, however,

is so large that it is doubtful if any violent upward swing in prices will take place.

Support for this assumption is to be found in the course of spot prices on Illinois and Indiana coals the past week. Small increases in quotations on central Illinois and Fifth Vein Indiana screenings and a slight readjustment in lump figures on Fourth Vein marked the extent of the changes. These increases were in nowise attributable to export or lake influences, but to weather conditions. If a violent swing comes, transportation difficulties or extreme weather conditions probably will be the cause.

Production in the Middle West, however, is better than the unemotional state of the spot market would indicate. But there still remains a large unused surplus capacity. In the Eastern fields, on the other hand, output is reaching the limits of labor and transportation facilities, particularly in West Virginia, parts of central Pennsylvania and eastern Kentucky. Even western Pennsylvania is recognizing the existence of a labor problem apart from the struggle to deunionize some of the mines in that field.

From present indications the unusual export movement will outlast the lake shipping season and soften the reaction which usually comes with the cessation of the heavy run of coal to the Lake Erie ports. Baltimore temporarily has robbed Hampton Roads of its leadership. During the week ended Oct. 14 there were 66 clearances from the first-named port, aggregating 409,990 gross tons. In the same period 23 vessels cleared from Hampton Roads with 158,596 tons of cargo coal for

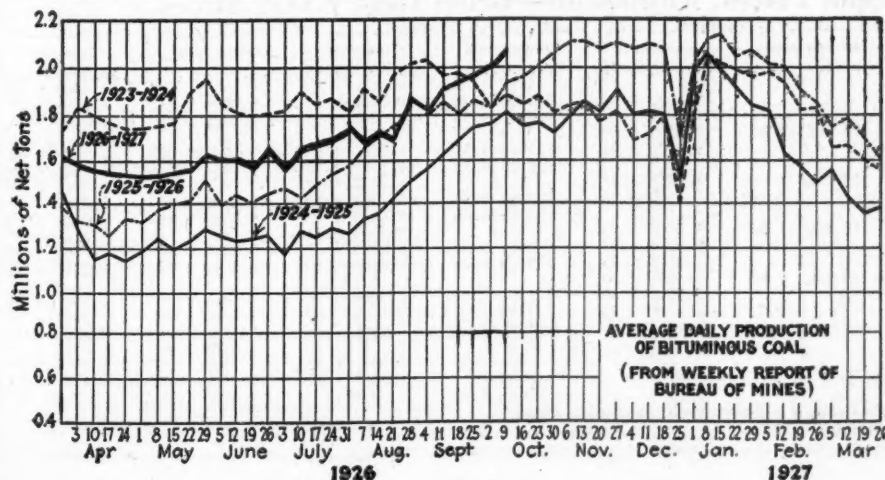
foreign ports. Sixty-nine of the vessels clearing from the two ports were destined to the United Kingdom and carried over 425,000 tons.

Output Again Passes 12,000,000 Tons

Output during the week ended Oct. 9 was estimated by the U. S. Bureau of Mines at 12,404,000 tons, an increase of 396,000 tons, or 3.3 per cent, over the preceding week. Figures for the loadings on Oct. 11 and 12 indicate that last week will register a further increase. Cumulative production to Oct. 9 was less than 1,000,000 tons behind 1920 and only 19,350,000 tons less than in 1923. Lake loadings the week ended Oct. 17 were 720,706 net tons of cargo and 47,617 tons of vessel fuel, bringing the season's total to date to 24,281,110 tons, as compared to 22,201,274 tons last year.

Coal Age Index of spot bituminous prices on Oct. 18 was 202 and the corresponding weighted average price was \$2.45. This was an increase of ten points and 12c over the figures for Oct. 11. Only one decline, an average of 5c. in West Virginia gas mine-run at Cincinnati, entered into the figures. Low-volatiles advanced 5 to 50c.—the last-named increase applying to New England shipments. Another flurry in western Pennsylvania shot up Pittsburgh district prices 15 to 60c. Both southern and eastern Ohio quotations were higher. Kentucky, too, moved upward.

Anthracite developments have been less spectacular, but steady improvement marks the course of the market in hard coal. Production the week ended Oct. 9 was 2,069,000 net tons. There



Estimates of Production

(Net Tons)

BITUMINOUS

	1925	1926
Sept. 25.....	11,232,000	11,717,000
Oct. 2 (a).....	11,008,000	12,008,000
Oct. 9 (b).....	11,681,000	12,404,000
Daily average.....	1,947,000	2,067,000
Cal. yr. to date.....	380,909,000	422,355,000
Daily av. to date..... (c)	1,596,000	1,770,000

ANTHRACITE

Sept. 25.....	13,000	2,509,000
Oct. 2 (a).....	14,000	2,052,000
Oct. 9 (b).....	15,000	2,069,000
Cal. yr. to date..... (c)	61,282,000	64,067,000

BEEHIVE COKE

Oct. 2 (a).....	187,000	184,000
Oct. 9 (b).....	203,000	208,000
Cal. yr. to date..... (c)	7,440,000	9,250,000

(a) Revised since last report. (b) Subject to revision. (c) Adjusted to equalize number of days in the two years.

has been no change in the relative positions of the different sizes, but premium stove finds a readier sale.

The Connellsville coke market was featureless last week.

Eastern Coals Dominate Market

The spurt in demand for Illinois and Indiana coals has proved short lived and Eastern coals again dominate the markets of the Middle West. Notwithstanding the strong seaboard pull, a considerable quantity of Eastern coal is moving to and through the Chicago gateway. Prices paid on spot tonnage, however, are forced up by the competition with export buyers. Choice West Virginia splint and eastern Kentucky block bring \$3.25@4, with some specialty coals at \$4@4.50. Smokeless mine-run is \$3@3.25.

Prepared sizes of low-volatile coal readily command \$5.25@5.75. Early last week some middle houses were quoting \$5@5.50 on transit lump and egg, but this was coal which had been

purchased several weeks ago and no one was willing to accept new business at those figures. Anthracite demand is satisfactory. Coke prices are exceedingly firm and the leading ovens are well booked ahead on orders.

Slowing up in the movement of the larger sizes of Illinois and Indiana coal has had one favorable reaction. The surplus of small coals has been cut into and prices on those sizes are stronger. Marked activity in the domestic sizes, in the opinion of producers, must wait upon a turn in the weather. Until that comes it is unlikely that there will be any further increases in the circular prices on the market leaders.

Running Time at Mines Disappointing

The full force of the falling off in domestic buying was not felt at the mines until the middle of last week. Prior to that time the pressure in southern Illinois had been on No. 2 nut and smaller sizes. Aside from Burlington and Missouri Pacific movement,

railroad tonnage was light. Stripping operations are getting back into shape after the floods and are rapidly approaching full-time production.

Conditions in the Duquoin and Jackson County fields are unchanged. Steam still is slow and there is some surplus of domestic sizes. Railroad buying continues to be the major stabilizing influence in the Mt. Olive district; domestic demand again has slumped; general steam trade is inactive. All mines in the Standard field are struggling to reduce the number of "no bills" and current prices offer little in the way of profit to the producer. Working time ranges from two to four days a week. Warm weather has checked the revival of activity in the St. Louis domestic market.

Western Kentucky operators still are eager for more business. As a result, prices have been held down and current quotations are the lowest in any of the major producing fields. In the eastern part of the state, however, buyers are

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Oct. 19 1925	Oct. 4 1926	Oct. 11 1926	Oct. 18 1926†	Midwest		Oct. 19 1925	Oct. 4 1926	Oct. 11 1926	Oct. 18 1926†
Smokeless lump.....	Columbus....	\$4.65	\$5.25	\$5.25	\$5.00@5.00	\$5.00@5.00	Franklin, Ill. lump.....	Chicago.....	\$3.25	\$3.25	\$3.25	\$3.25
Smokeless mine run.....	Columbus....	2.55	2.60	2.60	2.50@2.80	2.50@2.80	Franklin, Ill. mine run.....	Chicago.....	2.35	2.40	2.40	2.35@2.50
Smokeless screenings.....	Columbus....	1.50	1.40	1.40	1.35@1.50	1.35@1.50	Franklin, Ill. screenings.....	Chicago.....	1.60	1.50	1.50	1.40@1.65
Smokeless lump.....	Chicago.....	4.10	5.10	5.50	5.25@5.75	5.25@5.75	Central, Ill. lump.....	Chicago.....	2.85	2.60	2.85	2.75@3.00
Smokeless mine run.....	Chicago.....	2.10	2.85	3.00	3.00@3.25	3.00@3.25	Central, Ill. mine run.....	Chicago.....	2.10	2.20	2.20	2.15@2.25
Smokeless lump.....	Cincinnati.....	4.75	5.00	5.00	5.25@5.75	5.25@5.75	Central, Ill. screenings.....	Chicago.....	1.55	1.40	1.40	1.35@1.55
Smokeless mine run.....	Cincinnati.....	2.50	2.85	2.95	2.90@3.00	2.90@3.00	Ind. 4th Vein lump.....	Chicago.....	3.10	2.85	2.85	3.00@3.10
Smokeless screenings.....	Cincinnati.....	1.90	2.25	2.35	2.50	2.50	Ind. 4th Vein mine run.....	Chicago.....	2.35	2.25	2.25	2.15@2.35
Smokeless mine run.....	Boston.....	4.60	6.00	6.00	6.50	6.50	Ind. 4th Vein screenings.....	Chicago.....	1.60	1.45	1.50	1.45@1.60
Clearfield mine run.....	Boston.....	1.95	2.40	2.45	2.25@2.85	2.25@2.85	Ind. 5th Vein lump.....	Chicago.....	2.35	2.40	2.65	2.50@2.85
Cambridge mine run.....	Boston.....	2.25	2.60	2.60	2.35@3.00	2.35@3.00	Ind. 5th Vein mine run.....	Chicago.....	1.95	2.00	2.00	1.90@2.10
Somerset mine run.....	Boston.....	2.10	2.00	2.00	2.15@2.25	2.15@2.25	Ind. 5th Vein screenings.....	Chicago.....	1.40	1.05	1.30	1.25@1.50
Pool 1 (Navy Standard).....	New York.....	2.85	2.85	2.85	2.75@3.00	2.75@3.00	Mt. Olive lump.....	St. Louis.....	2.50	2.60	2.60	2.50@2.75
Pool 1 (Navy Standard).....	Philadelphia.....	2.65	2.75	2.75	2.75@3.00	2.75@3.00	Mt. Olive mine run.....	St. Louis.....	2.00	2.25	2.25	2.25
Pool 1 (Navy Standard).....	Baltimore.....	2.30	2.25	2.25	2.50@2.65	2.50@2.65	Mt. Olive screenings.....	St. Louis.....	1.75	1.25	1.25	1.25
Pool 9 (Super. Low Vol.).....	New York.....	2.20	2.35	2.35	2.40@2.60	2.40@2.60	Standard lump.....	St. Louis.....	2.25	2.15	2.15	2.10@2.25
Pool 9 (Super. Low Vol.).....	Philadelphia.....	1.95	2.25	2.25	2.50@2.75	2.50@2.75	Standard mine run.....	St. Louis.....	1.80	1.80	1.80	1.75@1.85
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.15	1.95	1.95	2.40@2.60	2.40@2.60	Standard screenings.....	St. Louis.....	1.15	1.05	1.05	1.00@1.10
Pool 10 (H.Gr. Low Vol.).....	New York.....	2.00	2.05	2.05	2.25@2.50	2.25@2.50	West Ky. block.....	Louisville.....	1.85	2.35	2.35	2.25@2.60
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....	1.85	2.00	2.00	2.25@2.50	2.25@2.50	West Ky. mine run.....	Louisville.....	1.35	1.30	1.30	1.15@1.50
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....	2.00	1.85	1.85	2.25@2.40	2.25@2.40	West Ky. screenings.....	Louisville.....	1.00	.95	.85	.75@1.00
Pool 11 (Low Vol.).....	New York.....	1.80	1.90	1.90	2.10@2.25	2.10@2.25	West Ky. block.....	Chicago.....	2.05	2.10	2.10	2.00@2.25
Pool 11 (Low Vol.).....	Philadelphia.....	1.70	1.80	1.80	1.90@2.25	1.90@2.25	West Ky. mine run.....	Chicago.....	1.25	1.15	1.15	1.00@1.35
Pool 11 (Low Vol.).....	Baltimore.....	1.80	1.80	1.80	2.15@2.25	2.15@2.25						
High-Volatile, Eastern							South and Southwest					
Pool 54-64 (Gas and St.).....	New York.....	1.55	1.60	1.75	2.50@2.75	2.50@2.75	Big Seam lump.....	Birmingham.....	2.25	2.35	2.35	2.25@2.50
Pool 54-64 (Gas and St.).....	Philadelphia.....	1.60	2.00	2.00	2.00@2.20	2.00@2.20	Big Seam mine run.....	Birmingham.....	1.80	1.85	1.85	1.75@2.00
Pool 54-64 (Gas and St.).....	Baltimore.....	1.80	1.85	1.85	2.05@2.15	2.05@2.15	Big Seam (washed).....	Birmingham.....	1.85	1.90	1.90	1.85@2.25
Pittsburgh ac'd gas.....	Pittsburgh.....	2.50	2.55	2.80	3.25@3.50	3.25@3.50	S. E. Ky. block.....	Chicago.....	3.00	2.85	3.35	3.50@4.00
Pittsburgh gas mine run.....	Pittsburgh.....	2.15	2.25	2.45	2.75@3.00	2.75@3.00	S. E. Ky. mine run.....	Chicago.....	1.95	1.75	1.75	1.75@2.25
Pittsburgh mine run (St.).....	Pittsburgh.....	2.05	2.05	2.05	2.15@2.30	2.15@2.30	S. E. Ky. block.....	Louisville.....	2.60	3.35	3.25	3.25@3.75
Pittsburgh slack (Gas).....	Pittsburgh.....	1.55	1.40	1.50	1.70@1.80	1.70@1.80	S. E. Ky. mine run.....	Louisville.....	1.50	1.80	1.75	1.75@2.25
Kanawha lump.....	Columbus....	2.60	2.75	3.00	3.00@3.50	3.00@3.50	S. E. Ky. screenings.....	Louisville.....	1.25	1.35	1.30	1.25@1.40
Kanawha mine run.....	Columbus....	1.70	1.95	1.95	2.00@2.50	2.00@2.50	S. E. Ky. block.....	Cincinnati.....	2.80	3.75	3.25	3.25@3.50
Kanawha screenings.....	Columbus....	1.30	1.15	1.15	1.10@1.25	1.10@1.25	S. E. Ky. mine run.....	Cincinnati.....	1.60	1.80	1.70	1.75@2.00
W. Va. lump.....	Cincinnati.....	2.60	3.10	3.25	3.00@3.75	3.00@3.75	S. E. Ky. screenings.....	Cincinnati.....	1.30	1.15	1.20	1.25@1.50
W. Va. gas mine run.....	Cincinnati.....	1.65	1.85	2.00	1.90@2.00	1.90@2.00	Kansas lump.....	Kansas City.....	4.50	4.60	4.60	4.50@4.75
W. Va. steam mine run.....	Cincinnati.....	1.55	1.65	1.80	1.75@2.00	1.75@2.00	Kansas mine run.....	Kansas City.....	2.85	3.00	3.00	3.00
W. Va. screenings.....	Cincinnati.....	1.25	1.15	1.20	1.25@1.50	1.25@1.50	Kansas screenings.....	Kansas City.....	2.40	2.35	2.35	2.35
Hooking lump.....	Columbus....	2.70	2.60	2.60	2.75@3.00	2.75@3.00						
Hooking mine run.....	Columbus....	1.65	1.55	1.55	1.60@2.00	1.60@2.00						
Hooking screenings.....	Columbus....	1.30	1.20	1.20	1.15@1.25	1.15@1.25						
Pitta. No. 8 lump.....	Cleveland.....	2.35	2.35	2.60	2.25@3.25	2.25@3.25						
Pitta. No. 8 mine run.....	Cleveland.....	1.85	1.80	2.05	2.00@2.10	2.00@2.10						
Pitta. No. 8 screenings.....	Cleveland.....	1.25	1.30	1.35	1.45@1.55	1.45@1.55						

* Gross tons, f.o.b. vessel, Hampton Roads

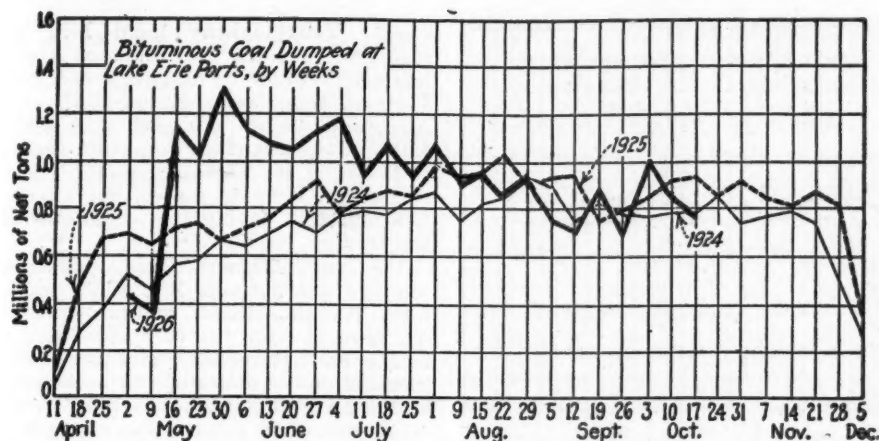
† Advances over previous week shown in heavy type, declines in italics

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Oct. 19, 1925		Oct. 11, 1926		Oct. 18, 1926†	
			Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34		\$8.20@8.95		\$8.50@9.25		\$8.50@9.25
Broken.....	Philadelphia.....	2.39			\$9.25	8.50@9.15	\$9.25	8.50@9.15
Egg.....	New York.....	2.34		8.65@8.90	8.75@9.25	8.75@9.25	9.00@9.25	8.75@9.25
Egg.....	Philadelphia.....	2.39		9.15@9.40	9.25@9.50	9.25@9.15	9.25@9.50	9.00@9.15
Egg.....	Chicago.....	5.06	\$9.50@10.00	8.03@8.29	8.14	8.13	8.14	8.13
Stove.....	New York.....	2.34		9.15@9.40	9.50@9.85	9.25@9.50	9.50@10.00	9.25@9.50
Stove.....	Philadelphia.....	2.39		8.48@8.80	9.75@10.20	9.35@9.50	9.75@10.20	9.35@9.50
Stove.....	Chicago.....	5.06	10.00@11.00	8.65@8.95	8.70	8.33@8.58	8.70	8.33@8.58
Chestnut.....	New York.....	2.34		8.65@8.95	9.25@9.50	8.75@9.15	9.25@9.50	8.75@9.15
Chestnut.....	Philadelphia.....	2.39			9.25@10.00	9.00@9.15	9.25@10.00	9.00@9.15
Chestnut.....	Chicago.....	5.06	10.00@11.00	8.50@8.75	8.39	8.33@8.53	8.39	8.33@8.53
Pea.....	New York.....	2.22		5.00@6.25	6.00@6.50	6.00@6.50	6.25@6.50	6.00@6.50
Pea.....	Philadelphia.....	2.14		5.00@6.25	6.30@6.75	6.00@6.50	6.30@6.75	6.00@6.50
Pea.....	Chicago.....	4.79	5.50@6.00	5.50@6.00	6.03	6.10	6.03	6.10
Buckwheat No. 1.....	New York.....	2.22		2.50@2.60	2.15@2.50	2.50@3.50	2.15@2.50	2.50@3.50
Buckwheat No. 1.....	Philadelphia.....	2.14		2.50@2.75	2.25@2.50	2.50@3.00	2.25@2.50	2.50@3.00
Rice.....	New York.....	2.22		2.25	1.90@2.00	2.00@2.25	1.90@2.00	2.00@2.25
Rice.....	Philadelphia.....	2.14		2.25	1.85@2.00	1.75@2.25	1.85@2.00	1.75@2.25
Barley.....	New York.....	2.22		2.25	1.25@1.50	1.50@1.75	1.25@1.50	1.50@1.75
Barley.....	Philadelphia.....	2.14		1.50	1.65@1.75	1.50@1.75	1.65@1.75	1.50@1.75
Birdeye.....	New York.....	2.22			1.40@1.65	2.00	1.40@1.65	2.00

* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type; declines in italics.

‡ Quotations withdrawn because of strike which started Sept. 1, 1925.



seeking tonnage and prices continue to advance. Block is quoted at \$3.25@ \$3.75, with some specialty offerings up to \$4.25; 2-in. lump is \$2.75@ \$3; egg, \$2.50@ \$3; slack, \$1.25@ \$1.40, with some shippers asking up to \$1.75. Western Kentucky block is \$2.25@ \$2.60; 4-in. lump, \$1.85@ \$2.15; egg, \$1.75@ \$2; nut, \$1.45@ \$1.75; mine-run, \$1.15@ \$1.50; screenings, 75c.@ \$1.

Eastern Kentucky Demand Heavy

Lake trade is absorbing a large quantity of eastern Kentucky coal and there is a growing movement to tidewater. Some mines are so well booked up that they are not canvassing the inland domestic and steam trades. Weather conditions, on the other hand, have made the latter buyers more anxious to place orders. Local car shortages have developed, causing the loss of one to one and one-half days' production at some mines. Retail stocks in and about Louisville are diminishing.

Business at the Head of the Lakes continues at a substantial rate, with buying well distributed among all classes of consumers. In the retail end, growing demand for prepared Pocahontas is threatened by decreased receipts from the lower ports, forcing more consumers back to anthracite. Dealers have launched a campaign to increase the domestic sales of No. 1 buckwheat. Dock prices are firmly held. The number of cargoes en route and being discharged every week is larger than was the case last month.

Steadiness, without unusual activity, characterizes the domestic market in the Twin Cities. There has been some expansion in steam coal buying, but weather conditions have so slowed up general industrial trade that an unfavorable reaction is feared. Both retail and wholesale prices on bituminous coals have been advanced at Milwaukee, with Pocahontas the bellwether. Wholesale prices are up 25c., and retail figures, which have been raised less frequently, 50c.@ \$1. Anthracite, too, is enjoying a brisk movement.

Kansas City Market Firm

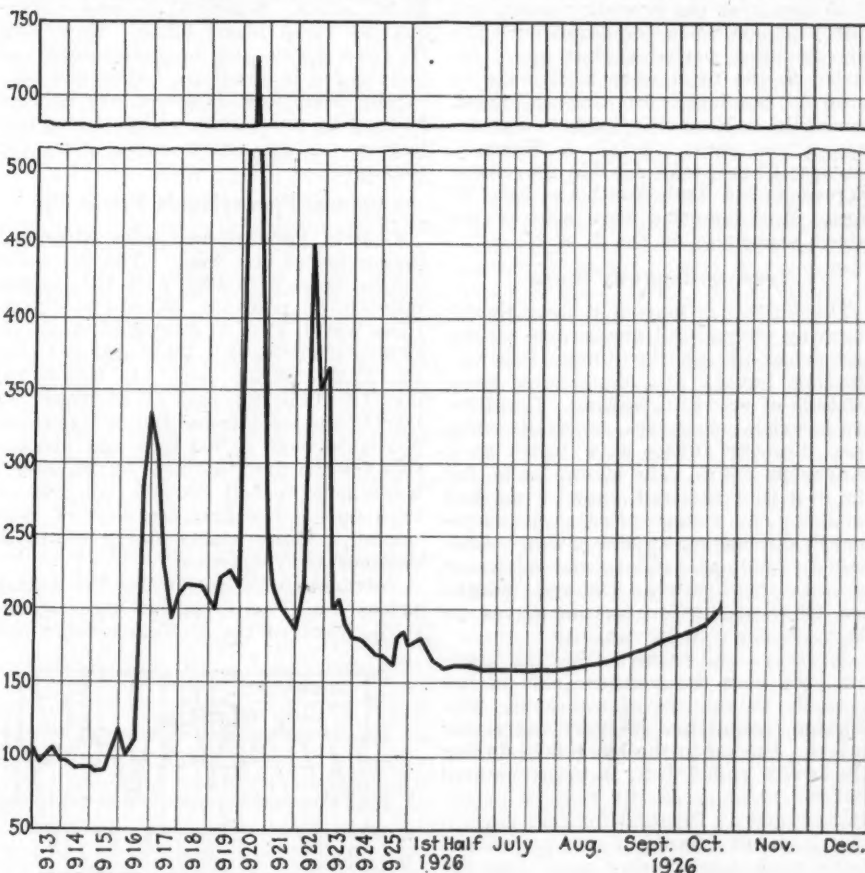
Despite an undercurrent of weakness, prices on steam coals in the Southwest hold at \$2.35 for Kansas screenings, \$1.50@ \$1.75 for Arkansas and \$2 for fine coal from Oklahoma and Missouri mines. Domestic grades are firm, with early advances in the wind. Kansas deep-shaft lump is moving freely at \$4.75. Arkansas semi-anthracite brings \$6 and Paris lump, \$6.50.

between different sizes, therefore, is fairly well balanced. Actual production, however, has been hit by a return of warmer weather. Rock Springs lump now is quoted at \$4.25; nut, \$3; slack, \$1.75; Kemmerer lump, \$5; nut, \$3.50; slack, \$1.75.

High-Volatile Still Booming

Midmonth saw a general upward turn in high-volatile prices in the Cincinnati market. Tidewater demand, coupled with increasingly irregular movement under a permissive-embargo system, has been the chief factor in the advance; continued car shortages in southeastern Kentucky and growing scarcity of labor have been secondary causes. With the largest Logan County producer setting the pace, prices in that field have advanced to \$3.75 for 6-in. lump, \$3.50 for 3-in. and \$3.25 for egg and 1½-in. lump. Slack, too, is stronger, with most sales near the top of a \$1.35@ \$1.50 range. Many shippers are refusing to book new orders.

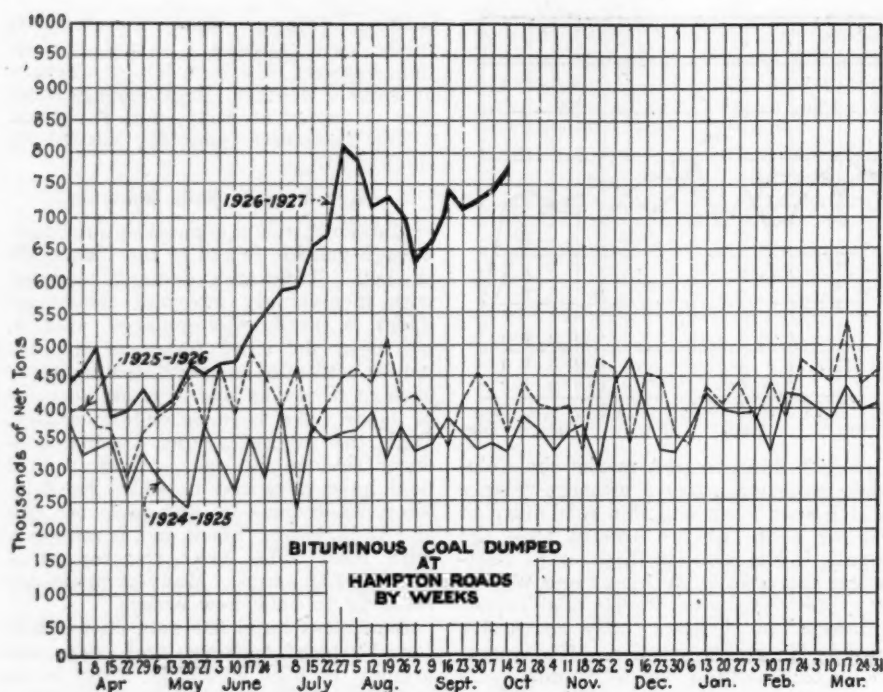
Smokeless lump has sold up to \$5.75 for Eastern delivery and egg has brought as high as \$5.50. Stove is up to \$5 and \$4.50 is asked for nut. Nominally prices on mine-run are unchanged, but it is difficult to place firm orders even at \$3. There is very little free slack to be had and this readily commands \$2.50. It is understood that Cincinnati retail prices will be advanced



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1926				1925	1924
Index	Oct. 18	Oct. 11	Oct. 4	Sept. 27	Oct. 19	Oct. 20
Weighted average price.....	202	192	188	183	176	176
	\$2.45	\$2.33	\$2.27	\$2.22	\$2.13	\$2.12

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke: 1913-1918," published by the Geological Survey and the War Industries Board.



to \$10.50 on smokeless lump and \$7.50 on high-volatile.

Movement through the Cincinnati gateway increased slightly last week. The total number of coal loads interchanged—13,842 cars—showed a gain of 45 cars over the preceding week, but a drop of 908 when compared with the corresponding period a year ago. Included in the total were 2,638 cars en route to the lakes for transshipment. Louisville & Nashville interchange decreased 280 cars; Norfolk & Western, 18 cars; Chesapeake & Ohio movement increased 296 and Southern Ry., 47 cars. More empties were sent to the mines, especially on the L. & N.

Nearing Runaway Stage

The Columbus market is nearing the runaway stage. All grades are strong and prices are on the jump. Procrastinating buyers are abandoning their attitude of watchful waiting. Retailers are feverish purchasers, especially when they discover stocks have fallen to a dangerous point. The steam trade, for the first time this fall, shows a marked tendency to rising prices. Hand-to-mouth purchasing agents now are compelled to bid against lake and tidewater interests for available tonnage. Southern Ohio production has increased to 65 to 70 per cent of capacity.

Northern and eastern Ohio are keeping pace with the southern part of the state in the matter of increasing production, heightened interest and rising prices. Output in the No. 8 field during the week ended Oct. 9 approximated 301,000 tons, or 43 per cent of potential capacity. Demand for fuel is coming from all classes of consumers and Ohio coals are entering more into the domestic trade because of the high prices and short supply of West Virginia low-volatile. Three-quarter lump is quoted at \$2.50 for lake shipment and up to \$3.25 has been paid for all-rail lump. Slack, too, is stronger.

Even sharper price gains have been registered in gas coals in the Pittsburgh district. The best grade of gas mine-run sold above \$3 last week and Con-

nellsville gas brought \$2.50@2.75. Three-quarter lump, less in demand than mine-run or slack, went to \$3.25@3.50; slack was \$1.70@1.80. The scramble for tonnage spread over into the steam sizes, with mine-run \$2.15@2.30; slack, \$1.60@1.75 and three-quarter lump about \$2.75. How long the new levels can be maintained nobody cares to predict. Labor and car-supply conditions, however, are helping to keep up quotations. Export and line buyers are in active competition for tonnage.

Central Pennsylvania Prices Up

Central Pennsylvania also witnessed higher prices last week. The increases ranged from 5 to 40c., with the largest increase on pool 10. Weed-end quotations were: Pool 1, \$2.80@3; pool 71, \$2.60@2.90; pool 9, \$2.35@2.60; pool 10, \$2.25@2.30; pool 11, \$2@2.10; pool 18, \$1.85@2; pool 14, \$1.90@2.15. During the week ended Oct. 9 shipments increased over 40,000 tons and production for the first ten days of the month was approximately 300,000 tons greater than during the first ten days of September. Many mines closed down all summer are reopening.

Advances of 5 to 50c. in the asking prices on Pennsylvania high-volatile coals featured the Buffalo market last

week. Youghiogheny lump held at \$2.75@3, but the maximum on slack jumped to \$1.75. Pittsburgh and No. 8 steam lump were \$2.40@2.75 and Allegheny Valley mine-run was \$2@2.10. Fairmont slack dropped a nickel to \$1.30@1.45. Gas coal is hard to get and steam lump is scarce, but buyers still object to paying the prices quoted and trading is dull.

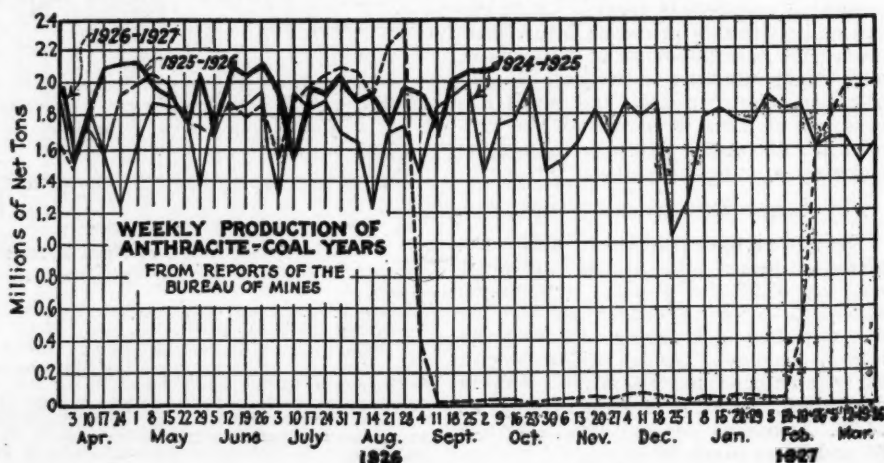
The combination of diminishing spot tonnage, putting pool 1 to \$6.50 gross, f.o.b., Hampton Roads, and an awakening interest upon the part of reluctant consumers has resulted in another advance in on-car prices of smokeless coal at the New England discharging ports. At Boston \$7.50 gross is the ruling figure, although buying is limited—as much by the scarcity of free tonnage as by the consumer's fight against prices. At Providence, where some shippers are completely out of the market, the asking price is \$7.25. Month-end shipments from the mines are quoted at \$3@3.25, net, or \$6@6.25 at the southern piers.

All-Rail Coals in Demand

For the first time in years Pennsylvania bituminous is being carried in stock by local shippers and is quoted at \$7 on cars, Boston. Considerably more coal could be moved all-rail if the shippers were able to furnish it, but extra choice Pennsylvania fuel is not flooding the New England market. Good grade low-volatile which sold for \$2.25 mines now is held at \$2.50, with \$2.75 asked for the better grades and some sales at \$3. A little low-volatile is offered for New Haven R.R. delivery at \$2.35.

The bituminous market at New York is climbing. Free tonnage is scarcer and prices are advancing, particularly on the lower grades. The general range on all grades of Pennsylvania coals has advanced from \$1.35@2.75 to \$2@3.25. Broad Top mine-run was quoted late last week at \$3@3.25. Many large industrial plants are making inquiries for deliveries to tide them over the wage-negotiation period next spring. Demand for export and bunker coal continues heavy, with quotations \$2.25@3.25. Pier prices showed little change last week, but advanced sharply at the opening of trading this week.

Another upward step in prices and buying interest featured the Philadelphia bituminous market last week. Spot tonnage is short. Contract customers



Car Loadings and Supply

	Cars Loaded—	
	All Cars	Coal Cars
Week ended Oct. 2, 1926.....	1,185,524	220,924
Week ended Sept. 25, 1926.....	1,182,940	211,722
Week ended Oct. 3, 1925.....	1,112,463	174,317
Week ended Sept. 26, 1925.....	1,120,645	178,463

	Surplus Cars—		Car Shortages—	
	All Cars	Coal Cars	All Cars	Coal Cars
Sept. 30.....	114,730	27,519		
Sept. 23, 1926...	124,142	30,205		
Sept. 30, 1925...	140,842	61,370		

are becoming quite insistent that they receive their full allotments. Some improvement in the labor situation in central Pennsylvania was reported, but there are many mines in that section which still are short-handed. Tide-water business is heavier and additional fixtures have been closed for early loading. Bunker demand also is keeping the piers busy.

Export Demand Swamps Baltimore

Export demand remains the ruling factor in the Baltimore market. During the first nine days of the month 69 coal cargoes were cleared for foreign ports. In one week Great Britain took over 320,000 gross tons. Where emergency buying to complete cargoes is necessary, sharp increases in prices are demanded. Industrial purchasing agents, nevertheless, cling to open-market orders, although there has been some increase in inquiries in the last few days.

Transshippers at Hampton Roads are confronted with a practical shortage of coal for the first time in years. Spot tonnage is hard to pick up; vessels are crowding the piers for service that is not available on anything like the regular schedules. The heavy demand, in the opinion of many, will keep up for several months. The bulk of the movement is for export, mostly in British bottoms. During the week ended Oct. 14 twenty-eight vessels with 158,596 gross tons, cleared for a dozen foreign countries. All Hampton Roads piers are again operating 24 hours a day.

The Birmingham district pursues the even tenor of its way undisturbed by the more feverish conditions farther north in the Appalachian Region. Demand is about on par with current output of high grade coals and standard medium grades move in a fairly satisfactory manner. Consumption of all grades of coking coal is heavy. Very little steam coal is mined in advance of orders for its disposition. Domestic production is closely regulated to demand, so that there is no troublesome accumulation of "no bills." Coke is active.

Anthracite Demand Healthy

Demand for anthracite at New York is good. Independent producers find their coals moving as readily as the larger companies. Stove coal still leads in ordering, but chestnut is a close runner-up. Egg is active in the metropolitan area, but somewhat slow in the line trade. Pea coal is stronger. Steam sizes are moving easily. The continuance of the British strike is throwing more Canadian business into the American market.

"Seasonable activity" describes the

hard-coal trade in Philadelphia territory. Most shippers are finding it difficult to ship stove as promptly as the buyers desire, but nut orders are taken care of with dispatch. The steam trade is holding its own. If anything, there is just the slightest indication of improvement in the No. 1 buckwheat movement, although independent shippers still make concessions to effect quick sales. Rice is plentiful but the scarcity of barley is helping the situation in No. 2 buckwheat.

Baltimore retail anthracite business is brisk, at unchanged prices. Boston distributors are clamoring for stove; some spot independent tonnage has brought \$10.25. Independent nut for New England has sold up to \$9.60@ \$9.75, but premium egg moves only in combination with stove. High-grade No. 1 buckwheat commands \$2.75. Retail prices, stove to pea, inclusive, have been increased 25c.; prepared low-volatile, 50c. Local Buffalo demand for anthracite is quiet; coke, too, is slow. During the week ended Oct. 14 lake loadings of anthracite at Buffalo were 54,500 tons, of which 22,100 tons were cleared for Milwaukee, 15,200 tons for Duluth and Superior, 6,500 tons for Waukegan, 5,500 tons for Chicago and 5,200 tons for Fort William.

Connellsville Coke Dull

The Connellsville coke market was dull last week. Both demand and free tonnage were light. Spot furnace hovered around \$3.50; spot foundry coke was quoted at \$4.25@ \$4.75, with sales at \$4.25 uncommon. Practically no negotiations for extended delivery under quarterly contracts are reported. Ovens talk \$4.50 furnace coke on the basis of recent quotations for raw coal, but such a price is considered out of the question at the present time.

Production of beehive coke in the Connellsville and Lower Connellsville region again increased during the week ended Oct. 9, when the total output was 153,350 net tons, according to the Connellsville Courier. Furnace-oven production was 72,500 tons, an increase of 1,000 tons when compared with the output the preceding week. Merchant-oven production was 80,850 tons, an increase of 2,590 tons.

May Prolong Compensation in Certain Instances

Attorney General George W. Woodruff of Pennsylvania, has written an opinion to Richard H. Lansburgh, State Secretary of Labor and Industry, who also is the chairman of the State Workmen's Insurance Board, regarding the maximum sums the Board may expend for medical and surgical treatment of injured employees. The new opinion superseded one on the same questions raised by Secretary Lansburgh last June, the decision then reached having been reconsidered.

The opinion of the Attorney General in part follows:

"It would, of course, be unlawful for the Board out of a spirit of generosity to agree to furnish surgical or medical or hospital service to an injured employee for a period greater than thirty days or to expend more than \$100 for surgical or medical services if there

were no prospect by such additional period of services or such additional expenditure of money of reducing the duration of disability or avoiding a loss of a member, as the case may be, and thereby saving money for the fund.

They do, however, have the power and, in our opinion, it is their duty, if upon competent advice they believe that an expenditure for surgical, medical or hospital services beyond the required period or in excess of the required amount will save money to the fund, to contract for the rendering of such extended service or the expenditure of such excess amount."

Traffic News

St. Louis-East St. Louis Rates Before Commission

Charges that the rates on bituminous coal from the Belleville district to East St. Louis, Ill., and St. Louis, Mo., unduly prefer the former destination and unjustly discriminate against the second-named city were the subject of a three-day hearing at St. Louis last week before Examiner Arthur Kettler of the Interstate Commerce Commission. The hearing, which opened on Oct. 12, involved an investigation of the Commission's own motion into rates from points in Illinois to the East St. Louis switching district and formal complaints filed against the railroads by the St. Louis Chamber of Commerce and the Perry Coal Co. et al.

The foundation for the inquiry was the action of the Illinois Commerce Commission in reducing rates from Illinois mines to East St. Louis 11 to 21c. per ton. This reduction, made some time ago, was not followed by corresponding reductions in the interstate rates to St. Louis. As a result, the St. Louis differential over its east-bank namesake was increased from 25c. to 33 and 46c. Interested Illinois carriers submitted the question to the Interstate Commerce Commission. Consumers and producers filed complaints asking that the same reductions ordered by the state board on intrastate traffic be extended to interstate shipments.

Witnesses for the railroads contended that the 25c. differential was reasonable, but that the reductions made by the Illinois commission would be a substantial drain on their revenues. According to the Illinois Central R.R., application of the lower rates from group 2 mines in 1925 would have reduced revenues \$417,913 and an extension of the same general basis to St. Louis would have entailed a further cut of \$571,913.

Dismissal of the complaint of the Chicago Coal Merchants' Association against rates on anthracite and bituminous coal from points in Pennsylvania, West Virginia and Indiana is recommended by Interstate Commerce Commission Examiner W. A. Disque.

The American Hide & Leather Co., of Boston, has filed complaints with the Interstate Commerce Commission against rates on anthracite and bituminous coal from Pennsylvania mines to Balston Spa, N. Y.

Foreign Market And Export News

Diminishing Imports of Coal Worry French Consumers

Paris, France, Oct. 7.—Diminishing receipts of coal from Germany and Belgium are causing some concerns in the French market. Heretofore, imports from these countries, plus the increased output from French mines, have been sufficient to take care of requirements and offset any losses in supply due to the British strike. Now, however, Belgium is pushed to meet internal demand and Germany is overloaded with orders.

The Lorraine and Saar mines have been unable to take full advantage of the greater demands for coal because labor is short. Large number of workers have emigrated to the German side of the Rhine, preferring payment in marks to that in francs. French colliery owners are trying to persuade them to return and with that end in view are improving working and living conditions in their districts.

Paris quotations on Saar coals for domestic consumption are: Gaillets, 161 fr.; cobbles, 173; nuts, 176; beans, 172; peas, 164 fr. Prices on Belgian industrial coals for French delivery have jumped 75 to 150 fr., f.o.b. mines.

During September, the O.R.C.A. received 126,676 tons of reparation coke.

The French coal industry produced 4,279,583 metric tons of coke, 85,248 tons of lignite, 322,303 tons of coke and 372,496 tons of patent fuel in August. Coal and lignite production showed a slight falling off from July output, when a combined total of 4,381,366 tons were mined.

Continuance of High Prices Forecast in Exports

High price levels probably will continue to rule export trade for some time, according to cabled reports to Washington reviewing the coal situation in various foreign markets.

With no progress made in the settlement of the British strike, German production during September was at a high level. August exports were at the rate of 48,000,000 metric tons per annum, as compared with a pre-war rate of 35,000,000 tons. France imported more coal in September than during any preceding month of the year, but the United States was a small factor in this business. Belgian reserve stocks are practically exhausted, despite the fact that record tonnages have been mined.

No early break in Italian prices is anticipated. Stocks are extremely low. Car shortage in Poland and heavy shipments to England impede the flow of Polish coal to Italy. Some Hungarian coal is offered, but the quality is poor.

The Egyptian market is quiet, but firm. Stocks on hand are low and current receipts light. American coal

leads in Argentine imports. Rio de Janeiro stocks are about normal; September arrivals were all American. Prices are irregular, lack of cargo space effecting immediate deliveries. The United States furnished two-thirds of Uruguay's imports during September, Germany the remainder.

The Reich, according to a cable report Monday, has curtailed exports from German mines to forestall home shortages, particularly in northern Germany.

Export Clearances, Week Ended Oct. 14

FROM HAMPTON ROADS

For United Kingdom:	Tons
Br. Str. Manhattan.....	9,459
Br. Str. Ixla.....	4,126
Br. Str. Silksworth.....	7,352
Br. Str. Tiberton.....	7,570
Nor. Str. Samnanger.....	6,322
Br. Str. Mathara.....	7,386
Br. Str. Tritonia.....	7,279
Nor. Str. Fageras.....	4,416
Br. Str. Charterhythe.....	5,795
Nor. Str. Romsdalshorn.....	9,202
Br. Str. Teespool.....	6,608
Br. Str. Telesfora de Larrinaga.....	8,505
Belg. Str. Belgier.....	6,639
For Italy:	
Ital. Str. Coloba, for Portovecchio de Piombino.....	7,516
For Scotland:	
Br. Str. Roman Prince, for Glasgow..	7,593
For England:	
Ital. Str. Carmania, for River Tyne..	6,825
Br. Str. Broompark, for London....	3,429
For Uruguay:	
Br. Str. Portloe, for Montevideo....	5,779
Nor. Mp. Primero, for Montevideo....	3,596
For Argentine:	
Nor. Str. Benwood, for Buenos Aires	5,395
Br. Str. Dungeness, for Rosario....	3,846
For British West Indies:	
Amer. Schr. Dunham Wheeler, for St. Georges.....	2,821
For New Brunswick:	
Nor. Str. Marstenen, for St. John... 2,740	
For Newfoundland:	
Nor. Str. Mathilda, for Cornerbrook..	5,673
For Nova Scotia:	
Nor. Str. Boreas, for Halifax.....	1,994
For Egypt:	
Grk. Str. Agia Marissa, for Port Said	6,697
For Brazil:	
Braz. Str. Ayunoco, for Pernambuco	3,443
Br. Str. Dunrobin, for Rio Grande	600
Do Sul.....	600

FROM BALTIMORE

For Argentine:	
Br. Str. King David, for Zarati....	4,391
Br. Str. Diadem, for Buenos Aires..	6,356
For England (to Queenstown for orders unless otherwise specified):	
Span. Str. Ordunte Mundi.....	4,889
Br. Str. Peebles.....	7,258
Br. Str. Marchioness of Bute.....	6,595
Br. Str. Minlan.....	8,278
Br. Str. Anglo Columbian.....	10,111
Br. Str. Everilda.....	4,403
Br. Str. Anglo Egyptian.....	9,413
Br. Str. Cornish City.....	7,005
Br. Str. Islemoor, for Swansea, Wales, for orders.....	5,214
Br. Str. Illingsworth.....	8,501
Br. Str. Ingleby.....	5,160
Br. Str. Roxby.....	6,538
Span. Str. Upo Mendi.....	5,181
Br. Str. Pearlmoor.....	7,513
Br. Str. Farnworth.....	7,059
Nor. Str. Sorvard.....	6,278
Gk. Str. Geo. M. Embiricos.....	9,764
Br. Str. Dakotian.....	8,107
Br. Str. Watsness.....	4,208
Br. Str. City of Salisbury.....	8,343
Br. Str. Ralsdale.....	6,264
Du. Str. Aggersund.....	4,067
Br. Str. Anglo Peruvian.....	8,667
Br. Str. Trelevan.....	6,624
Br. Str. Kurdistan.....	6,323
Ital. Str. Dardania.....	5,008
Span. Str. Astol Mendi.....	6,580
Br. Str. Anglo Indian.....	8,774

Br. Str. Belgian.....	7,159
Y.-S. Str. Vojoda Putnik.....	8,491
Br. Str. Cogandale.....	8,107
Br. Str. Hebrdale, for London.....	5,434
Br. Str. Glenaster.....	4,824
Br. Str. Blairmore.....	4,427
Ital. Str. Recca.....	7,274
Swed. Str. C. F. Liljevalch.....	6,998
Span. Str. Eretza Mendi.....	5,609
Ger. Str. Passat.....	8,627
Ger. Str. Hilda Hugo Stinnes.....	4,929
Br. Str. Apsley Hall.....	7,267
Br. Str. Spenser.....	5,281
Br. Str. Ellaston.....	5,879
Br. Str. Bradavon.....	7,004
Br. Str. Siam City.....	7,230
Br. Str. Tabora.....	4,699
Br. Str. Ikala.....	6,231
Br. Str. Rio Azul.....	6,339
Br. Str. Shelley.....	6,681
Br. Str. Baluchistan.....	6,207
Dan. Str. Borgluin, for Lands End for orders.....	3,223
For Brazil:	
Braz. Str. Uru, for Pernambuco....	5,286
For Turkey:	
Gr. Str. Anna Vassilkis, for Constantinople.....	4,520
Br. Str. Despina, for Constantinople	5,496
For Egypt:	
Br. Str. Finchley, for Alexandria... 6,849	
Br. Str. Wokingham, for Alexandria	5,012
For Ireland:	
Br. Str. Carrigan Head for Belfast..	5,433
Br. Str. Glenfinlas, for Belfast....	4,548
Br. Str. Eastwood, for Belfast.....	5,016
For Italy:	
Am. Str. Eastern Sea for Naples....	6,946
Ital. Str. Giovanni for Genoa.....	9,934
Ital. Str. Humanitas for Leghorn... 6,396	
For Algeria:	
Br. Str. Mokta for Oran.....	5,563
For France:	
Nor. Str. Songa, for Havre.....	4,591
For Russia:	
Br. Str. Denham, for Novorissick....	3,608

FROM PHILADELPHIA

For United Kingdom:	
Br. Strs. Prince Gaelic, New Mexico, Magdala, Eskbridge, Inverness, Antar, Manchester Commerce, Biela; Swed. Str. Kirua; J.-S. Str. Grebeno.....	—
For Canary Islands:	
Gr. Str. Dionysios, Br. Str. Afghanistan, for Las Palmas.....	—
For Argentine:	
Br. Msp. Lenfield, for Buenos Aires ...	—
For Cuba:	
Nor. Str. Sokndal, for Havana.....	—
For Haiti:	
Dan. Str. Nordstjernen, for Fort de France.....	—
For Denmark:	
Am. Str. Ahwidale, for Copenhagen ...	—
For Cape Verde Islands:	
Am. Str. Commercial Pioneer, for St. Vincent.....	—
For France:	
Br. Str. Valette, for Havre.....	—

Hampton Roads Coal Dumpings*

(In Gross Tons)	Oct. 7	Oct. 14
N. & W. Piers, Lamberts Pt.:		
Tons dumped for week.....	235,869	280,559
Virginian Piers, Sewalls Pt.:		
Tons dumped for week.....	190,653	185,748
C. & O. Piers, Newport News:		
Tons dumped for week.....	243,013	224,452

* Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers' protest.

Pier and Bunker Prices, Gross Tons

PIERS	Oct. 7	Oct. 14†
Pool 1, New York....	\$5.50@5.75	\$5.50@5.75
Pool 9, New York....	5.00@5.25	5.10@5.40
Pool 10, New York....	4.75@5.00	4.80@5.00
Pool 11, New York....	4.60@4.75	4.70@4.80
Pool 9, Philadelphia..	5.10@5.30	5.35@5.55
Pool 10, Philadelphia..	4.80@5.00	5.05@5.25
Pool 11, Philadelphia..	4.50@4.70	4.75@4.95
Pool 1, Hamp. Roads..	6.25@6.35	6.50@6.75
Pool 2, Hamp. Roads..	6.15@6.25	6.00@6.30
Pool 3, Hamp. Roads..	5.75	6.35@6.40
Pools 5-6-7, Hamp. Rds.	6.00	5.75@6.00
BUNKERS		
Pool 1, New York....	\$5.75@6.00	\$5.75@6.00
Pool 9, New York....	5.25@5.50	5.35@5.65
Pool 10, New York....	5.00@5.25	5.05@5.25
Pool 11, New York....	4.85@5.00	4.95@5.10
Pool 9, Philadelphia..	5.35@5.50	5.60@5.80
Pool 10, Philadelphia..	5.05@5.25	5.25@5.50
Pool 11, Philadelphia..	4.75@4.95	5.00@5.20
Pool 1, Hamp. Roads..	6.35	6.75
Pool 2, Hamp. Roads..	6.25	6.20@6.30
Pools 5-6-7, Hamp. Rds.	6.00	5.75@6.00

† Advances over previous week shown in type; declines in italics.

Coming Meetings

Illinois Coal Traffic Bureau. Annual meeting Oct. 28, Fisher Bldg., Chicago, Ill. Traffic Manager, W. Y. Wildman, Fisher Bldg., Chicago, Ill.

National Safety Council. Oct. 25-29, at Detroit, Mich. Managing director, W. H. Cameron, 108 East Ohio St., Chicago, Ill.

National Conference of Business Paper Editors. Annual convention at Hotel Astor, New York City, Nov. 8-10. Secretary, D. G. Woolf, 334 Fourth Ave., New York City.

Illinois Mining Institute. Annual meeting, Nov. 12 and 13 at Harrisburg, Ill. Edward Coulehan, superintendent, Saline County Coal Corp., Harrisburg, Ill., chairman of committee on arrangements.

Bituminous Coal Conference, Carnegie Institute of Technology, Pittsburgh, Pa., Nov. 15 to 18. Secretary, Prof. Sumner B. Ely, Carnegie Institute of Technology, Pittsburgh, Pa.

Harlan County Coal Operators' Association. Annual meeting Nov. 17 at Harlan, Ky. Secretary, E. R. Clayton, Harlan, Ky.

National Industrial Traffic League. Commodore Hotel, New York City, Nov. 17 and 18. Executive secretary, J. W. Beek, Chicago, Ill.

American Welding Society. Fall meeting Nov. 17-19, Buffalo, N. Y. Secretary, M. M. Kelly, 29 W. 39th St., New York City.

American Society of Mechanical Engineers. Annual meeting, Engineering Societies Building, 29 W. 39th St., New York City, Dec. 6-9. Secretary, Calvin W. Rice, 29 W. 39th St., New York City.

Coal Mining Institute of America. Annual meeting, Chamber of Commerce, Pittsburgh, Pa., Dec. 8, 9 and 10. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

Coal Operators' Association of the Thick Vein Freeport Seam of Penn. Annual meeting Dec. 14, at Pittsburgh, Pa. Secretary, C. W. Gibbs, Pittsburgh, Pa.

Smokeless Coal Operators' Association of West Virginia. Annual meeting Dec. 9, at Washington, D. C. (tentative) Secretary, E. J. McVann, Insurance Bldg., Washington, D. C.

New Companies

Portland Coal Co., of Morgantown, W. Va., has been granted a charter. The company, which has an authorized capital stock of \$50,000 is organized to own, lease and mine coal and sell coke. The incorporators are A. Q. Davis, of Uniontown, Pa.; John A. Adams, of Tunnelton, W. Va.; W. D. Van Horn, of Tunnelton; W. R. Harris, of Morgantown, and Frank W. Adams of Tunnelton.

The Mannington Fuel Co., Mannington, Ky., with \$25,000 capital, has been incorporated by John G. Thomas, Margaret S. Thomas and Robert Waters.

New Equipment

A Definite-Time Relay

A definite-time relay for operation on direct-current circuits has been designed by the General Electric Co. This is made in two forms and designated as type MC-12, one for 115-volt operation, the other for 230 volts.

The new relay is designed to operate within a range of from 5 seconds, minimum, to 35 minutes, maximum. An extra lead is brought out through the enclosing case for connecting to the necessary resistor. A resistor mounted inside the case is connected in multiple with the motor armature to give constant speed.

Quick to Start When Needed

Interest of the coal-mining industry in self-contained prime movers such as internal combustion engines for standby service, is increasing. A new line of Diesel engines built in ratings of 480, 600 and 720 hp. has recently been announced by the Fairbanks-Morse Co., of Chicago, Ill. These engines will particularly lend themselves to standby, or emergency service, on account of their simplicity in design. The manufacturers claim that the construction of these machines has been greatly simplified and that they require little attention during operation. They are two-cycle, single acting machines using airless injection and embody the fundamental simplicity of the smaller engines of this type.

Being compact, yet accessible, these machines are built to stand the hardest service with the minimum of operating attention and they show also, according to the manufacturer, excellent fuel economy. A matter which is important in engines for this type of service is reliability. These machines, it is claimed, start and run so smoothly that there is little difficulty from this source.

Control is centered in a compact and

accessible unit located at the center of the engine. A governor is mounted beside the injection and air starting mechanism thus centralizing the complete control system.

A large hand wheel is used in starting. When this is turned to starting position, air at about 250 lb. pressure is admitted to the cylinders in such sequence that the engine begins to turn over. The wheel is then revolved to the running position and firing commences.

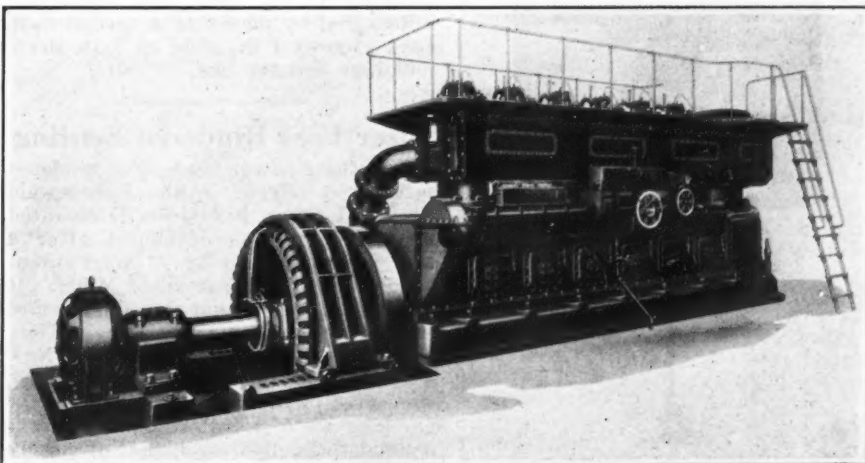
Speed control is accomplished by a conveniently located governor. A simple fuel pump is required for each cylinder and since high pressure air is not used for fuel injection, the mechanism required for starting is free from complications. The whole starting operation takes only a few seconds.

Pressure lubrication is employed. A rotary pump draws oil from a storage tank and forces it first through a duplex strainer and then through a cooler into the header in the lower base of the engine. From here the oil is distributed by branch lines to all bearings.

Steel Tie Now Available for Main Line Service

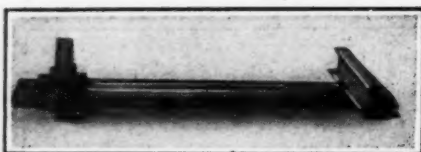
Steel mine ties for room-track service have proved successful on account of their long life and the saving in height they make possible. The West Virginia Rail Co. of Huntington, W. Va., has designed and is now manufacturing the steel mine tie for main-line use shown in the accompanying illustrations.

These ties utilize a bolted clip on one side of the rail and a riveted clip extending the full width of the tie on the other side. The bolted clips have a dependent lug fitting against the edge of a rectangular hole in the tie, also a square shoulder abutting the rail flange thus taking all thrust and pre-



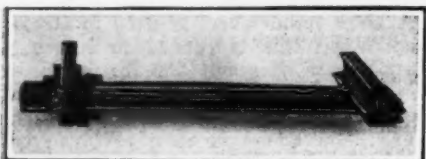
Simple Engine Makes Good Standby

A self-contained prime mover, that on account of its quick starting feature, will lend itself readily to standby service. Its capacity range suits it to many applications.



Easily Installed

The stationary clip is of steel, rolled to exact shape, having a square-flange bearing shoulder extending the full width of the tie. This affords maximum stiffness to the tie while at the same time giving a minimum of weight.



Slips Under Existing Track

This tie can be put into existing tracks without springing the rails, by merely sliding it into place, raising, and moving slightly, so that the fixed clips engage the rail flange. It is then only necessary to hammer the rotary clip around through one-quarter turn, then insert and tighten the bolted clip.

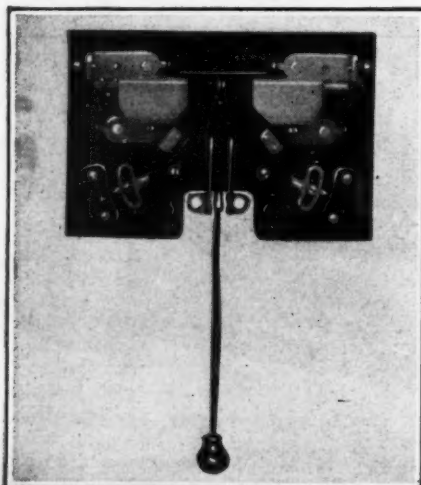
venting any sidewise motion of the rails. The clips are placed in these positions so that this type of tie can be put into existing track without springing the rails.

Tee-head bolts permit the clips being applied from the top after the ties have been put in place. These ties are suitable for use with rails up to 70 lb. in weight.

Complete Motor Protection

Complete protection is provided for single-, two-, or three-phase motors by having two heating elements in each two phases; protection for motors on direct-current circuits is obtained by having the heating elements connected on each side of the line. This has been accomplished by the General Electric Co., Schenectady, N. Y., by redesigning the TC-121 temperature overload relay.

This improved relay is known as the form C, or TC-121-C. Improvements in design allow the use of renewable heating elements, prevent the bending of thermostatic strips by operators and include a better mechanical construction.



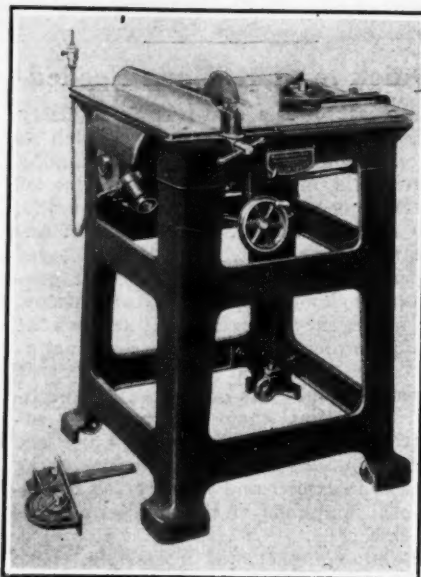
Protects Motors from Overloads

The relay is conveniently reset by means of a cord and button suspended from the bottom. Its heating elements are renewable.

Can Be Taken to the Job

When the portable floor type of universal circular saw was developed it combined the advantages of the portable bench machine with those of the self-contained floor type. Such a unit, shown in the accompanying illustration will doubtless fill many needs around the mines. It can be used in the shop as a floor type machine yet being portable it can be moved to construction jobs. The motor and working parts are built into the upper section together with the table and fences, the top portion being a complete self-contained bench saw when lifted off the regular stand.

J. D. Wallace and Co., Chicago, Ill., is the manufacturer. The table is one piece of finished steel, 25 in. square fitted with a removable throat piece so that special saws, dado and cope heads requiring a wider throat opening may



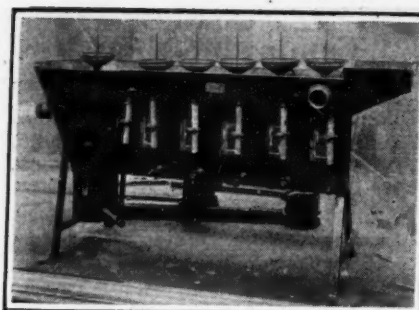
Serves Both Shop and Field

This saw can be moved to the work. It is heavy enough to cut fairly heavy planking yet light enough to be taken from the shop to the construction job in the field.

be used. This machine is designed to handle small work accurately, safely and quickly. It is sufficiently powerful to cut 24 in. stock. With the various adjustments it will cut compound miters and by means of a special dado head grooves 1/4 in. wide by 1 in. deep, moldings and the like.

Sizer Uses Hindered Settling

Something new in the field of hindered settling is offered in the Fahrenwald sizer. It is an hydraulically-operated machine that was developed after a long series of tests by A. W. Fahrenwald of the U. S. Bureau of Mines. It is just announced that its manufacture and sale have been taken by The Dorr Co., engineers, of 247 Park Ave., New York City. This table, it is claimed, will take unsized feed in which the particles are of a uniform specific gravity and will deliver a number of closely sized products, and it will take an unsized feed in which the particles are not of uniform specific gravity and will deliver a series of hydraulically classi-



Light and Compact Sizer

Claimed to be simple to install, easily handled and automatic in operation, starting up after a shutdown without supervision.

fied products. In addition to this, it will take a sized feed in which the particles are not of uniform specific gravity and separate them according to specific gravity, or, in other words, make a concentration. The sizer is a six-pocket machine, the compartments having straight, non-sloping sides so that the velocity of the water is uniform over the whole area. The spigot discharge valve is controlled by a diaphragm subjected to every change of conditions in the classifying pockets, and this, it is claimed, automatically insures uniform quality of the spigot products.

It is stated that numerous installations of the machine for preparing feed for concentrating tables have resulted in remarkable improvements in table operation.

Industrial Notes

The Stephens-Adamson Mfg. Co., of Aurora, Ill., manufacturers of conveying, elevating, screening and crushing machinery, has established a branch office in the Martin Building, Birmingham, Ala. The office will be in charge of W. E. Harris, former district manager of the Huntington (W. Va.) office of the company.

The Ironton Engine Co., Ironton, Ohio, has moved its Pittsburgh (Pa.) office to 210 Second Avenue. The Weinman Pump & Supply Co. is the Ironton company's representative in the Smoky City.

The Kuhlman Electric Co., Bay City Mich., manufacturers of power, distribution and street-lighting transformers, announces the appointment of H. F. Darby, Jr., 1700 Walnut Street, Philadelphia, Pa., as direct factory representative in the Philadelphia district. For more than twenty years Mr. Darby was with the Cutter Electrical & Manufacturing Co. and during the last six years he was sales manager of that organization.

The Atlas Car & Mfg. Co., Cleveland, Ohio, announces the appointment of B. O. Leftwich as representative for its line of electric industrial cars and locomotives in the southwestern United States and northern Mexico. Mr. Leftwich's headquarters are in Phoenix, Ariz.

The Central Alloy Steel Corporation is the name recently adopted by the Central Steel Co., Massillon, Ohio.